

3" DETECTABLE BLUE MARKING TAPE LABELED "CAUTION WATERLINE BELOW" TO BE INSTALLED 24" ABOVE PIPE.

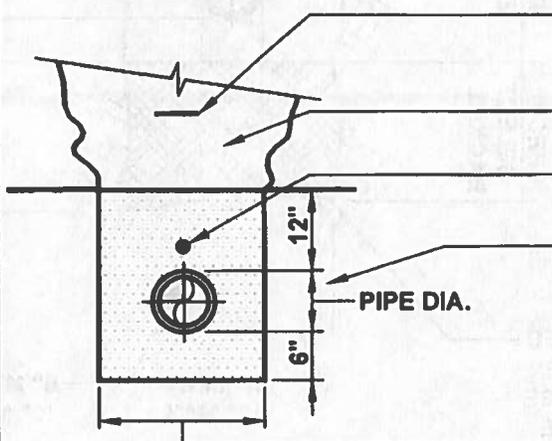
MECHANICALLY COMPACTED BACKFILL MATERIAL IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS

INSTALL TRACE WIRE 6" ABOVE PIPE. REFER TO SD-027 AND SD-027-A.

DUCTILE IRON AND REINFORCED CONCRETE CULVERT PIPE ON NON-ROCK TRENCH BOTTOMS BELL HOLES SHALL BE EXCAVATED TO ASSURE CONTINUOUS PIPE BARREL SUPPORT FOR FULL LENGTH OF PIPE SECTIONS. UNLESS DIRECTED OTHERWISE BY THE CONTRACT SPECIFICATIONS. TRENCH SIDEWALLS SHALL BE PLUMB WITHIN PIPE ZONE.

PIPE DIA. PLUS 2' MAX.
PIPE DIA. PLUS 1' MIN.

DETAIL 001A



3" DETECTABLE BLUE MARKING TAPE LABELED "CAUTION WATERLINE BELOW" TO BE INSTALLED 24" ABOVE PIPE.

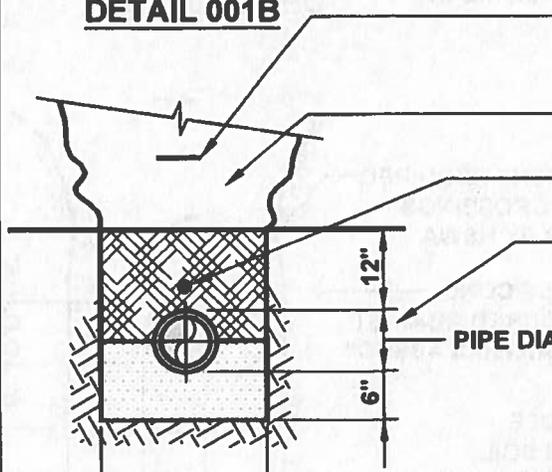
MECHANICALLY COMPACTED BACKFILL MATERIAL IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS

INSTALL TRACE WIRE 6" ABOVE PIPE. REFER TO SD-027 AND SD-027-A.

PVC PIPE AT ALL LOCATIONS. TRENCH SIDEWALLS SHALL BE PLUMB WITHIN PIPE ZONE

PIPE DIA. PLUS 2' MAX.
PIPE DIA. PLUS 1' MIN.

DETAIL 001B



3" DETECTABLE BLUE MARKING TAPE LABELED "CAUTION WATERLINE BELOW" TO BE INSTALLED 24" ABOVE PIPE.

MECHANICALLY COMPACTED BACKFILL MATERIAL IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS

INSTALL TRACE WIRE 6" ABOVE PIPE. REFER TO SD-027 AND SD-027-A.

DUCTILE IRON PIPE AND REINFORCED CONCRETE CULVERT PIPE ON ROCK TRENCH BOTTOM. TRENCH SIDEWALLS SHALL BE PLUMB WITHIN PIPE ZONE.

DETAIL 001C

PIPE DIA. PLUS 2' MAX.
PIPE DIA. PLUS 1' MIN.

-  SELECTED EXCAVATED MATERIAL
MECHANICALLY COMPACTED
MAXIMUM SIZE ROCKS- 3"
-  2B CRUSHED STONE OR
CRUSHED GRAVEL.
1B CRUSHED STONE OR
CRUSHED GRAVEL WITH
APPROVAL BY THE OWNERS
REPRESENTATIVE.

<p>PREPARED FOR</p> <p>Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY</p> <p>KLH ENGINEERS INC</p> <p>5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax 412-494-0426 info@klhengineers.com</p>	<p>TRENCH PIPE ZONE DETAIL</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-001</p>

NOTE:

WHERE SPECIAL SELECT BACKFILL IS REQUIRED BETWEEN THE PIPE ZONE AND THE SURFACE MATERIAL, THE PIPE ZONE SHALL EXTEND 12" ABOVE THE PIPE REGARDLESS OF PIPE MATERIAL



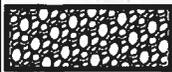
SELECTED EXCAVATED MATERIAL
MECHANICALLY COMPACTED
MAXIMUM SIZE ROCKS- 3"



2B CRUSHED STONE OR
CRUSHED GRAVEL.
1B CRUSHED STONE OR
CRUSHED GRAVEL WITH
APPROVAL BY THE OWNERS
REPRESENTATIVE.



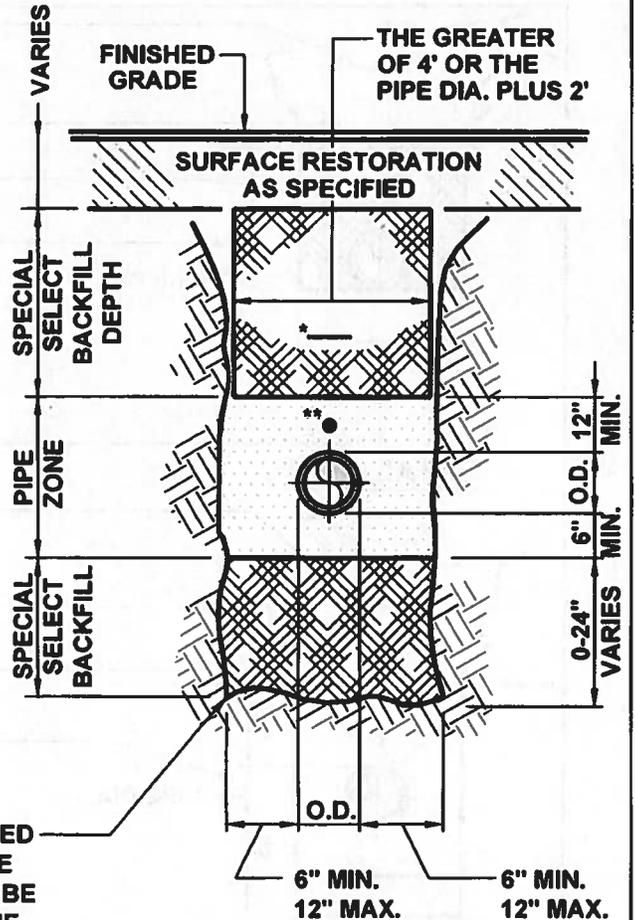
CLASS "C" CONCRETE



MECHANICALLY COMPACTED
BACKFILL

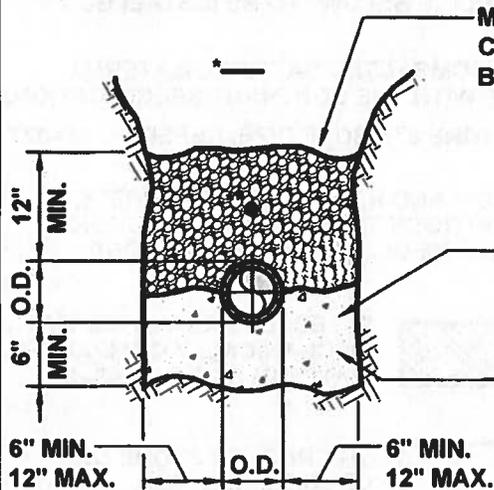
* — 3" DETECTABLE BLUE MARKING TAPE
LABELED "CAUTION WATERLINE BELOW"
TO BE INSTALLED 24" ABOVE PIPE.

** ● INSTALL TRACE WIRE 6" ABOVE PIPE.
REFER TO SD-027 AND SD-027-A.



**SPECIAL BACKFILL
DETAIL 002 A**

WHERE EXCAVATION EXPOSES THE BOTTOM OF PROPOSED TRENCHES WHERE VERY SOFT OR OTHER UNSTABLE PIPE FOUNDATION MATERIALS EXIST, THE CONTRACTOR WILL BE DIRECTED TO OVERCUT OR STABILIZE / OVERCUT AND THE CONTRACTOR SHALL BE COMPENSATED FOR THE ADDITIONAL EXCAVATION IN ACCORDANCE WITH THE PROVISIONS SPECIFIED IN THE GENERAL CONDITIONS.



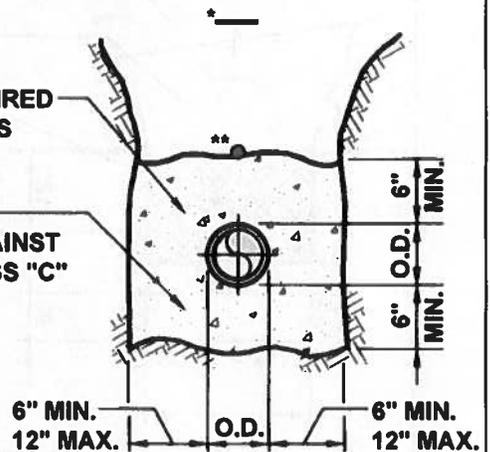
**TYPICAL CONCRETE CRADLE
DETAIL 002 B**

MECHANICALLY
COMPACTED
BACKFILL

CONC. ENCASEMENT REQUIRED
AT ALL STREAM CROSSINGS
OR AS DIRECTED BY HSWA

6" MIN. THICKNESS CONC.
ENCASEMENT POURED AGAINST
UNDISTURBED EARTH CLASS "C"
CONCRETE

CONCRETE CRADLE
REQUIRED WHEN SOIL
CONDITIONS DICTATE OR
AS DIRECTED BY HSWA



**TYPICAL CONCRETE ENCASEMENT
DETAIL 002 C**

PREPARED FOR
**Hampton Shaler
Water Authority**
3101 McCully Rd
Allison Park, Pa 15101
Allegheny County, Pennsylvania

PREPARED BY
KLH
ENGINEERS INC.
5173 Campbells Run Road
Pittsburgh, Pa 15205
Phone 412-494-0510 - Fax: 412-494-0426
info@klhengineers.com

TRENCH DETAILS

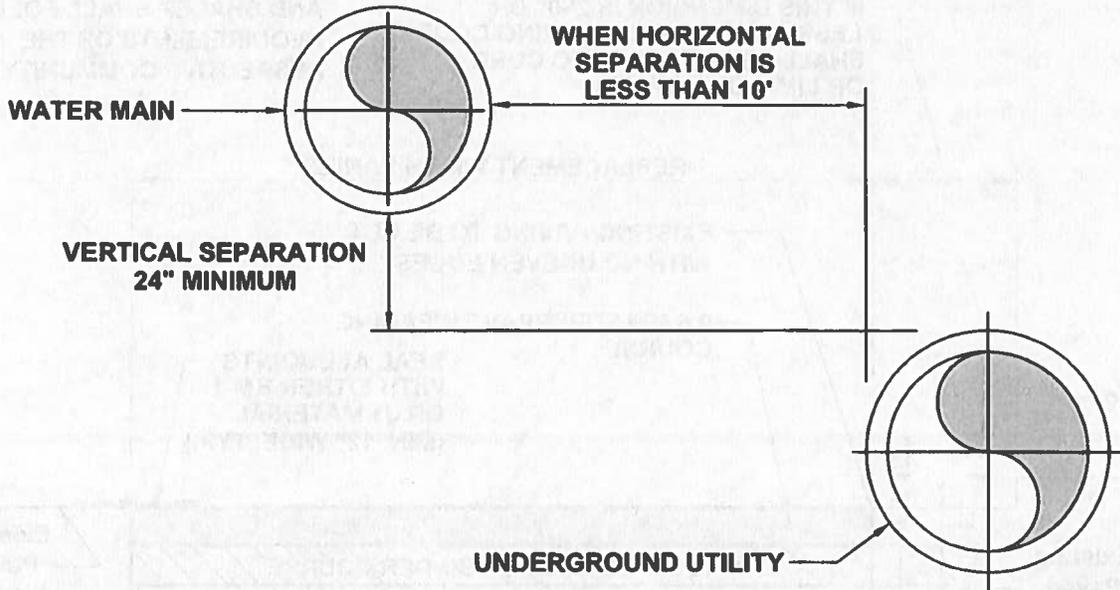
Standard Detail SD-002

Not to scale

September 2023

Standard Detail SD-002

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NOTES:

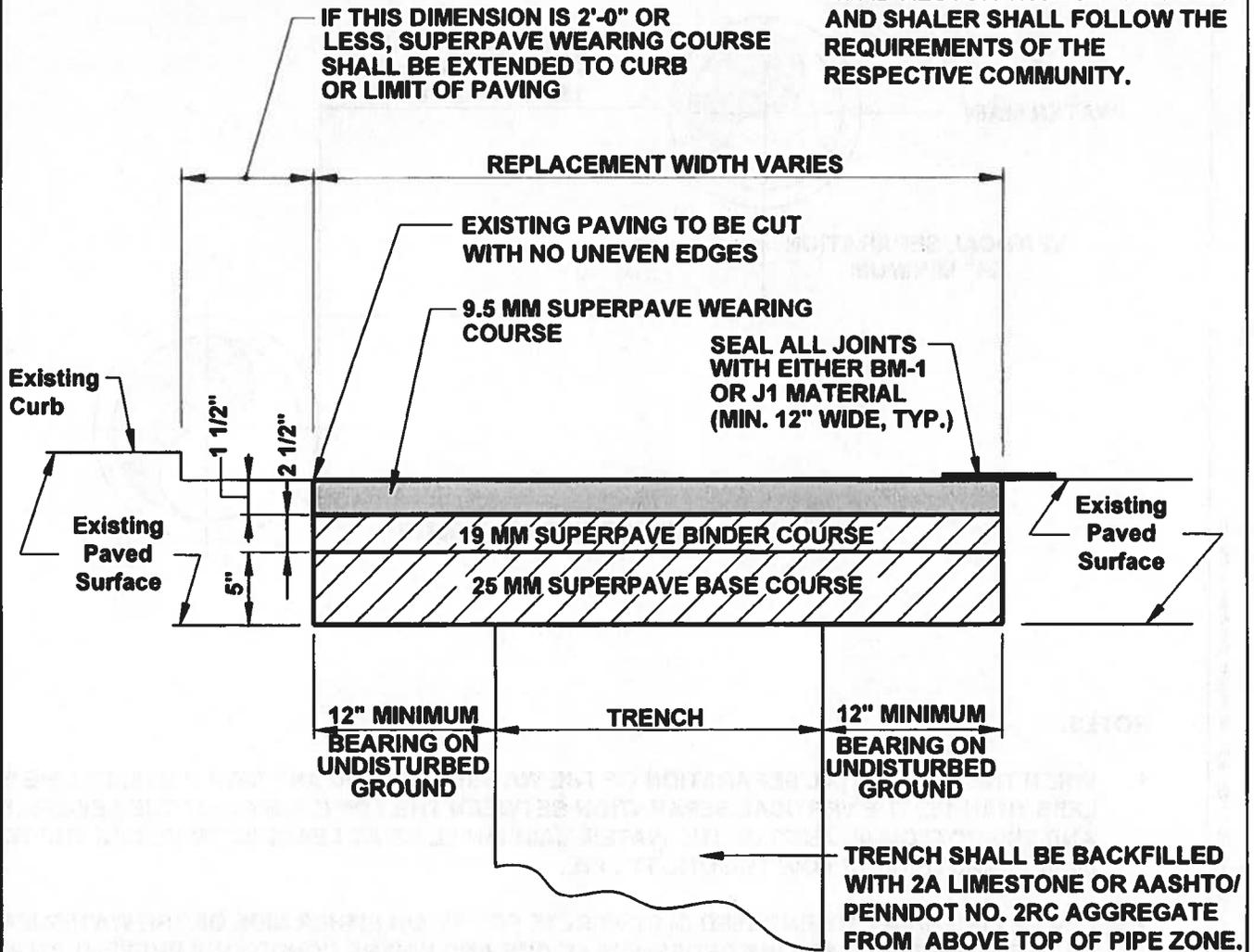
1. WHEN THE HORIZONTAL SEPARATION OF THE WATER MAIN AND ANY OTHER UTILITY LINE IS LESS THAN 10', THE VERTICAL SEPARATION BETWEEN THE TOP (CROWN) OF THE SEWER LINE AND THE BOTTOM (INVERT) OF THE WATER MAIN SHALL BE AT LEAST 24" WHETHER THE WATER MAIN IS ABOVE OR BELOW THE UTILITY LINE.
2. SEWER LINE SHALL BE ENCASED IN CONCRETE FOR 10' ON EITHER SIDE OF THE WATER MAIN WHERE SEWER / WATER LINE CROSSINGS OCCUR AND WHERE CONDITIONS PREVENT AN 24" VERTICAL SEPARATION.
3. THERE SHALL BE AT LEAST A 10' HORIZONTAL SEPARATION BETWEEN WATER MAINS AND SANITARY SEWER FORCE MAINS. FORCE MAINS CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 24" BETWEEN THE OUTSIDE OF THE FORCE MAIN AND THE OUTSIDE OF THE WATER MAIN WHETHER THE WATER MAIN IS ABOVE OR BELOW THE SEWER LINE.
4. SEPARATION OF THE WATER MAIN AND ELECTRIC (BOTH PRIMARY & SECONDARY), COMMUNICATIONS, AND FIBER OPTIC WILL BE NO LESS THAN 6' UNLESS OTHERWISE APPROVED BY HAMPTON SHALER WATER AUTHORITY.

<small>PREPARED FOR</small> Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania	<small>PREPARED BY</small> KLH <small>ENGINEERS, INC.</small> 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax 412-494-0426 info@klhengineers.com	REQUIRED DISTANCES BETWEEN WATER AND UNDERGROUND UTILITIES
Not to scale	March 2025	Standard Detail SD-003

NOTE:

REFERENCE SUPERPAVE
PER PA DOT SECTION 409,
MIXTURE & DESIGN STANDARDS

THIS DETAIL APPLIES TO WORK
PERFORMED IN MILLVALE, ETNA,
INDIANA, WEST DEER, AND
SHARPSBURG.
ROAD RESTORATION IN HAMPTON
AND SHALER SHALL FOLLOW THE
REQUIREMENTS OF THE
RESPECTIVE COMMUNITY.

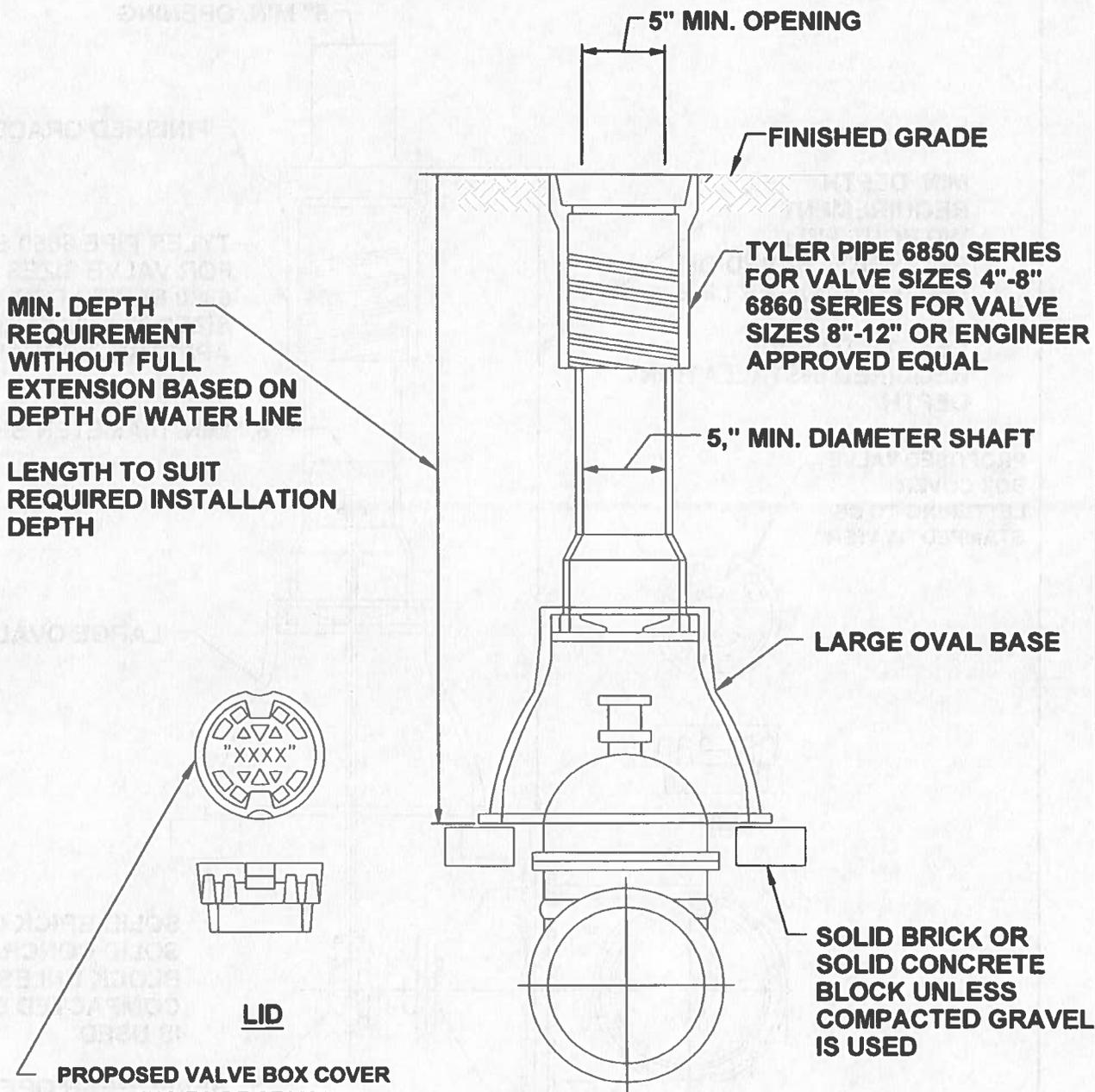


NOTE:

DURING COLD WEATHER WHEN SUPERPAVE MATERIAL IS NOT AVAILABLE FROM THE ASPHALT PLANTS, OR IF DIRECTED BY THE ENGINEER, THE TRENCH SHALL BE BACKFILLED WITH 2RC SELECT MATERIAL TO AN ELEVATION WITHIN 3" OF THE ROAD SURFACE. THE TRENCH SHALL THEN BE SURFACED WITH A TEMPORARY PATCH OF COLD PATCH MATERIAL. AS SOON AS THE ASPHALT PLANTS OPEN IN THE SPRING, THE CONTRACTOR SHALL REMOVE THE COLD PATCH AND 2RC MATERIALS AND SAW-CUT THE REQUIRED BENCHES AND THE SUPERPAVE MATERIAL SHALL THEN BE PLACED AND SEALED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE ON THE TEMPORARY PATCH AND SHALL KEEP A SMOOTH RIDING SURFACE ON THE STREET.

* FOR CONCRETE SURFACED ROADWAYS, THE REQUIREMENTS OF PA DOT PUBLICATION 408 ARE REQUIRED.

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<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-004</p>



MIN. DEPTH REQUIREMENT WITHOUT FULL EXTENSION BASED ON DEPTH OF WATER LINE

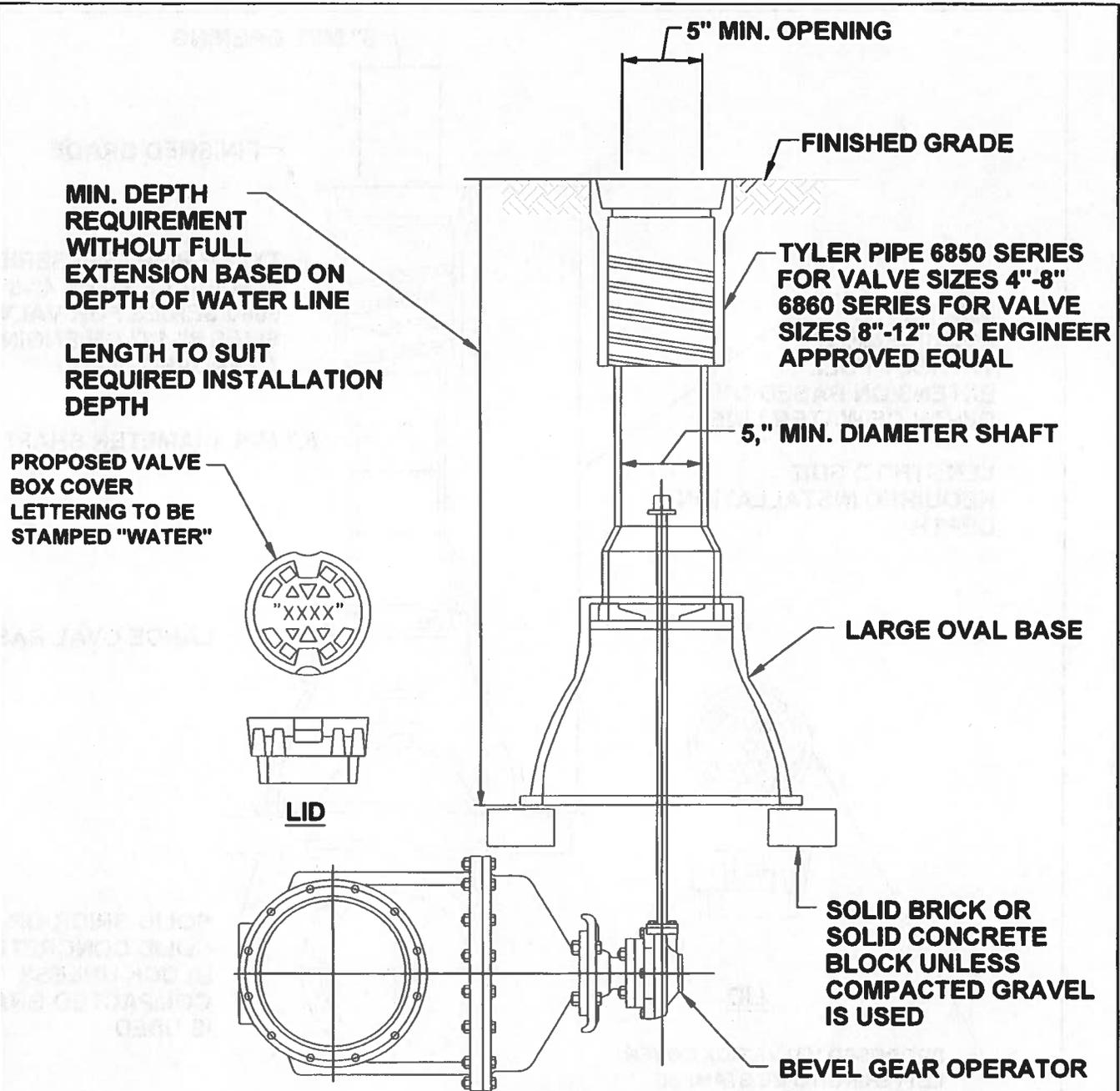
LENGTH TO SUIT REQUIRED INSTALLATION DEPTH

PROPOSED VALVE BOX COVER LETTERING TO BE STAMPED "WATER"

NOTES:

1. ALL BOXES SET PLUMB AND CENTERED OVER OPERATING NUT.
2. ALL CONTACT SURFACES MACHINED.
3. C.I. VALVE BOXES SHALL BE COATED WITH 2 COATS OF COAL TAR PITCH VARNISH OR OWNER APPROVED PROTECTIVE COATING.

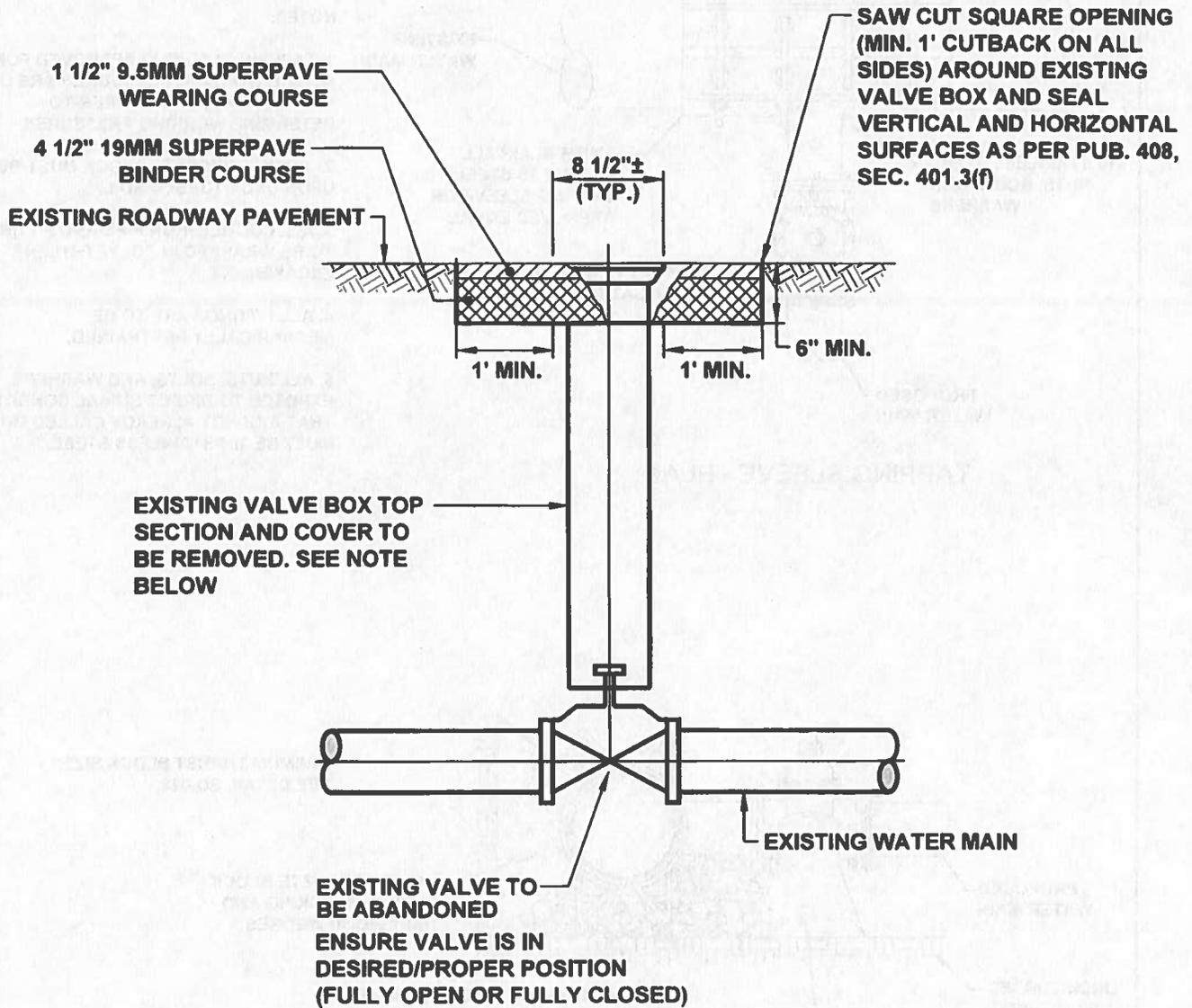
<p>PREPARED FOR Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY KLH ENGINEERS INC 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax 412-494-0426 info@klhengineers.com</p>	<p>STANDARD VALVE BOX AND COVER DETAIL</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-005</p>



NOTES:

1. ALL BOXES SET PLUMB AND CENTERED OVER OPERATING NUT.
2. ALL CONTACT SURFACES MACHINED.
3. C.I. VALVE BOXES SHALL BE COATED WITH 2 COATS OF COAL TAR PITCH VARNISH OR OWNER APPROVED PROTECTIVE COATING.

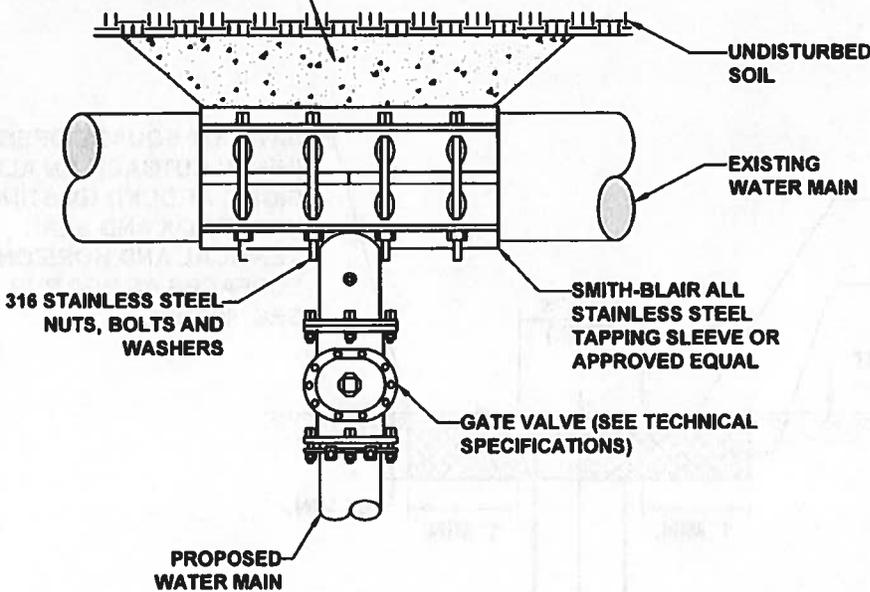
<p>PREPARED FOR:</p> <p>Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY:</p> <p>KLH ENGINEERS INC</p> <p>5173 Campbells Run Road Pittsburgh, Pa 15205 Phone: 412-484-0510 - Fax: 412-484-0426 info@klhengineers.com</p>	<p>VALVE BOX AND COVER DETAIL FOR HORIZONTAL INSTALLATION OF 12" & LARGER VALVES WITH MINIMUM COVER</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-006</p>



NOTE:
 VOID LEFT BY PULLED VALVE BOX TOP SECTION TO BE FILLED WITH CONCRETE TO A LEVEL 6" BELOW EXISTING PAVED SURFACE

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<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-007</p>

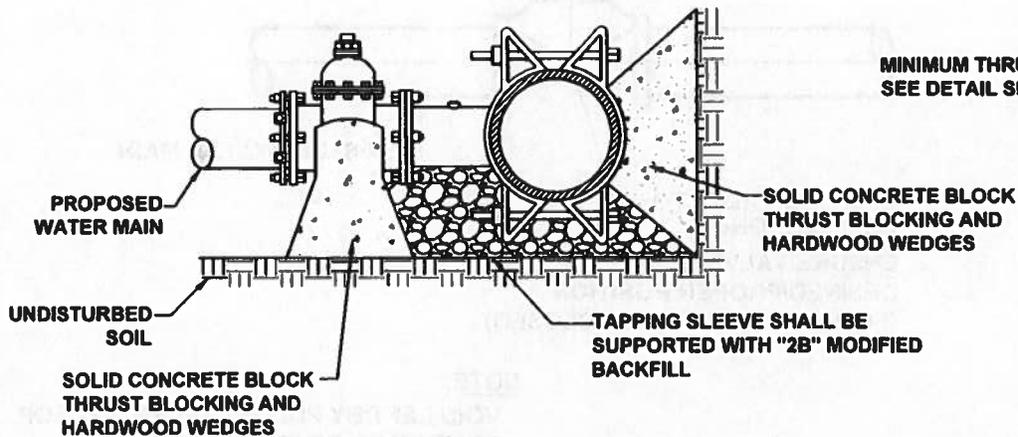
SOLID CONCRETE BLOCK
THRUST BLOCKING AND
HARDWOOD WEDGES



TAPPING SLEEVE - PLAN

NOTES:

1. TAPPING SLEEVE IS APPROVED FOR USE WHERE WORKING PRESSURES ARE UNDER 150 PSI. CONSULT ENGINEER TO DETERMINE WORKING PRESSURES.
2. SOLID CONCRETE BLOCK MUST BEAR UPON UNDISTURBED SOIL.
3. ALL DUCTILE IRON PIPE AND FITTINGS TO BE WRAPPED IN POLYETHYLENE ENCASUREMENT.
4. ALL FITTINGS ARE TO BE MECHANICALLY RESTRAINED.
5. ALL NUTS, BOLTS, AND WASHERS EXPOSED TO DIRECT BURIAL CONDITIONS, THAT ARE NOT ALREADY CALLED OUT, MUST BE 304 STAINLESS STEEL.



TAPPING SLEEVE - ELEVATION

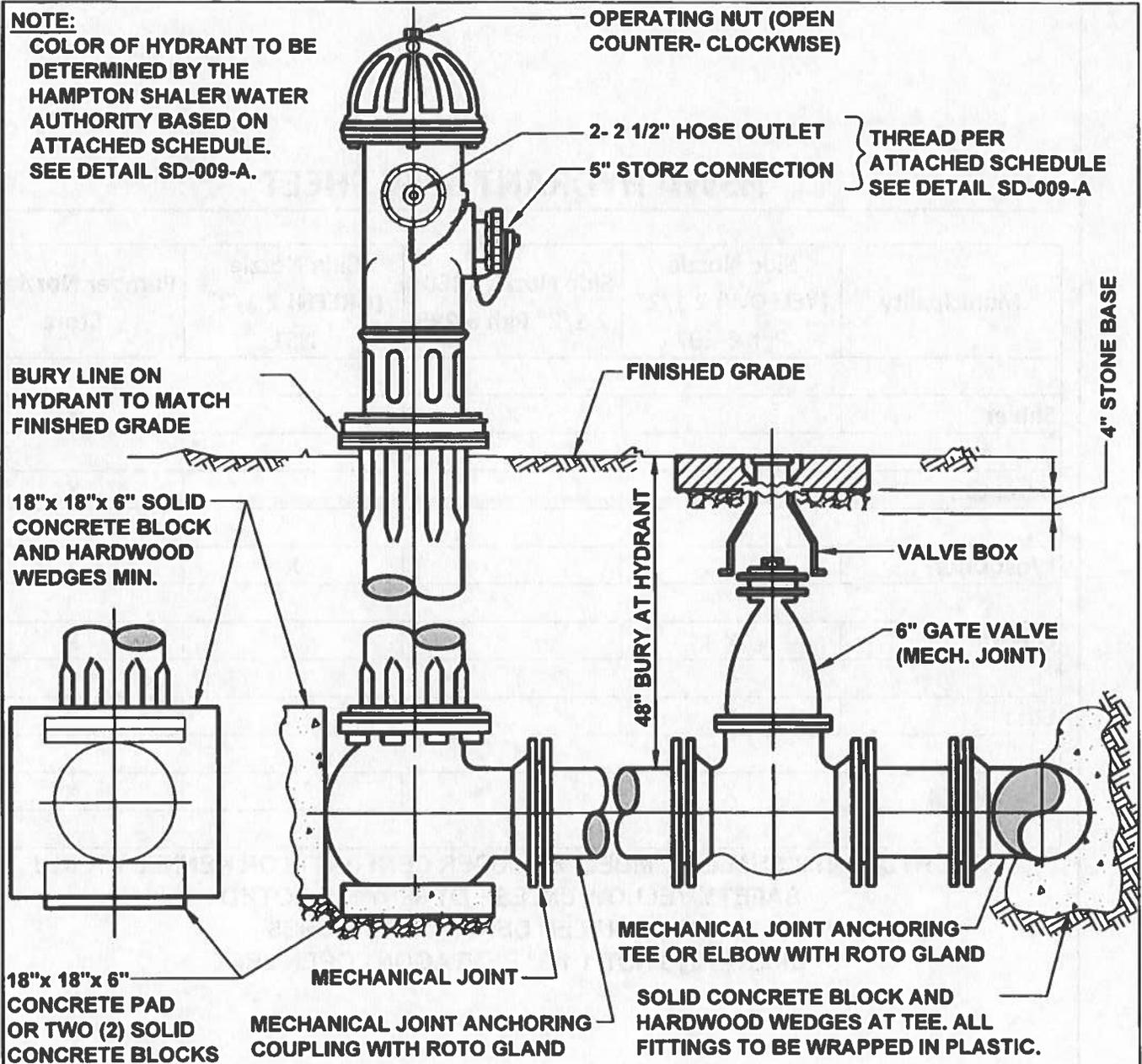
MINIMUM THRUST BLOCK SIZES -
SEE DETAIL SD-023.

**NOTE: WET TAP MUST BE AT
LEAST ONE LINE SIZE SMALLER**

<p>PREPARED FOR Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY KLH ENGINEERS, INC. 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone: 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com</p>	<p>TAPPING SLEEVE (LIVE TAP) WITH THRUST BLOCK</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-008</p>

NOTE:

COLOR OF HYDRANT TO BE DETERMINED BY THE HAMPTON SHALER WATER AUTHORITY BASED ON ATTACHED SCHEDULE. SEE DETAIL SD-009-A.



NOTES:

1. IN THE INSTALLATION OF ALL FIRE HYDRANTS IN SLOPING AREAS, THE CONTRACTOR SHALL EXCAVATE AROUND ALL SIDES OF THE HYDRANT FOR A DISTANCE OF AT LEAST 18" AND CONSTRUCT A SELF-SUSTAINING DRY STONE WALL IN THE EXCAVATED AREA TO PREVENT EARTH FROM MOVING INTO THE AREA.
2. CONTRACTOR SHALL INSTALL 12 CUBIC FEET OF 3/4" BROKEN STONE OR GRAVEL AROUND THE BASE OF HYDRANT AND COVER THE AGGREGATE WITH 40 MIL. POLYTHYLENE.
3. ALL HYDRANTS PLACED IN EXCAVATED AREAS SHALL BE PROTECTED AND BE MADE COMPLETELY ACCESSIBLE.
4. FIRE HYDRANT SHALL FACE ROADWAY.

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<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-009</p>

HSWA HYDRANT SPEC SHEET

Municipality	Side Nozzle (YELLOW) 2 1/2" Pgh 6-297	Side Nozzle (RED) 2 1/2" Pgh 6-295	Side Nozzle (GREEN) 2 1/2" NST	Pumper Nozzle 5" Storz
Shaler		X		X
Hampton	X			X
West Deer			X	X
O'Hara	X			X
Etna	X			X
Sharpsburg	X			X

ALL HYDRANTS SHALL BE MUELLER SUPER CENTURION OR KENNEDY K 81d
SAFETY YELLOW UNLESS OTHERWISE NOTED
MINIMUM BURIED DEPTH OF 42 INCHES
OPERATING NUT 1 1/2" PENTAGON - OPEN LEFT

<small>PREPARED FOR</small> Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania	<small>PREPARED BY</small>  5173 Campbelle Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax 412-494-0426 info@klhengineers.com	FIRE HYDRANT ASSEMBLY SPEC SHEET SCHEDULE 2 OF 2
Not to scale	September 2023	Standard Detail SD-009-A

M.J. FIRE HYDRANT
ASSEMBLY WITH SOLID
CONCRETE BLOCK AND
HARDWOOD WEDGES

6" M.J. GATE VALVE
& VALVE BOX

6" ANCHORING ELBOW
WITH SOLID CONCRETE
BLOCK AND HARDWOOD
WEDGES

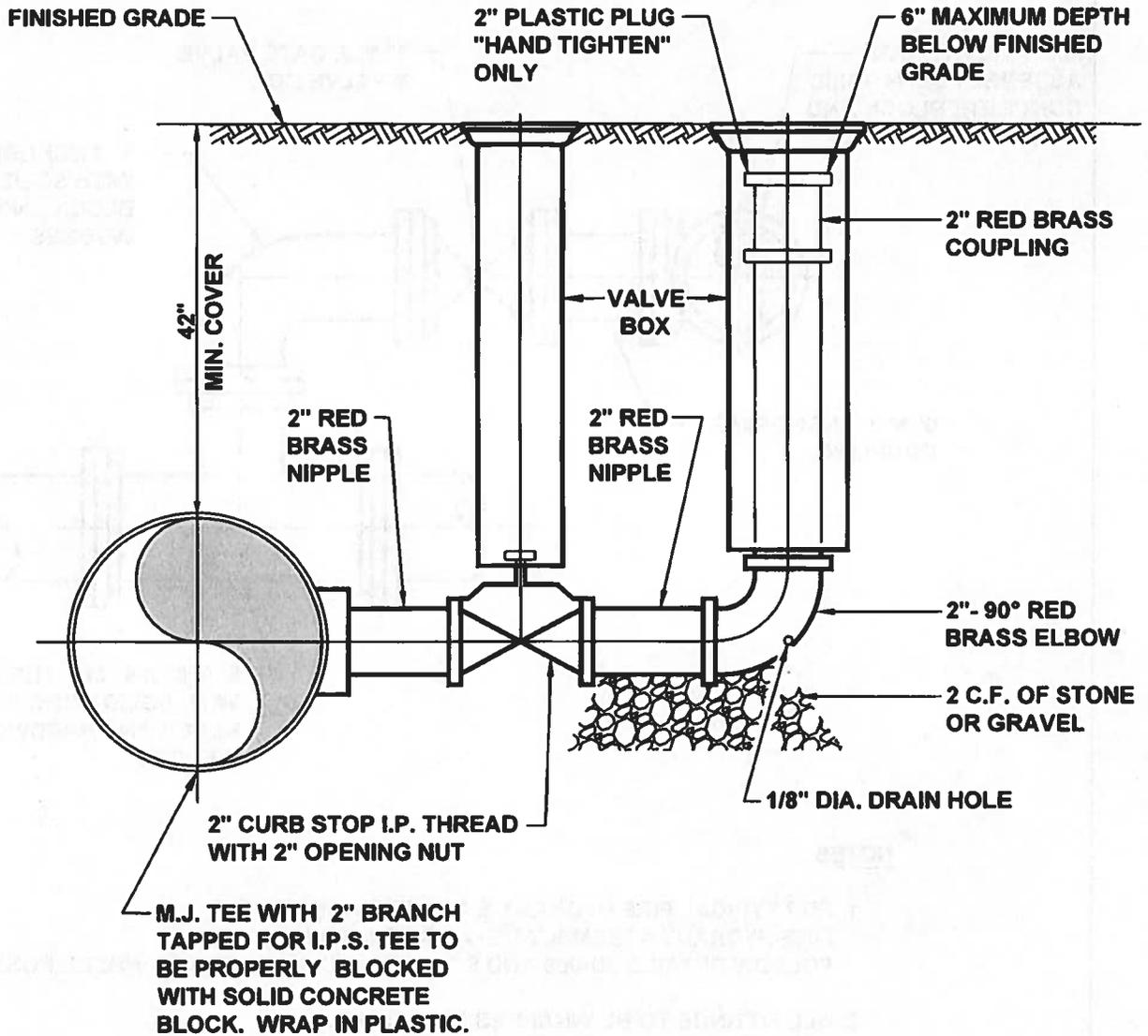
6" M.J. ANCHORING
COUPLING

8" X 8" X 6" M.J. TEE (TYP.)
WITH SOLID CONCRETE
BLOCK AND HARDWOOD
WEDGES

NOTES:

1. FOR TYPICAL FIRE HYDRANT & APPURTENANCES SEE FIRE HYDRANT ASSEMBLY DETAILS SD-009 AND SD-009-A. FOLLOW DETAILS SD-009 AND SD-009-A AND AVOID BENDS WHERE POSSIBLE.
2. ALL FITTINGS TO BE WRAPPED IN PLASTIC .
3. FIRE HYDRANT TO FACE ROADWAY.
4. THIS STANDARD APPLIES TO DEVELOPMENTS WITH SIDEWALKS.

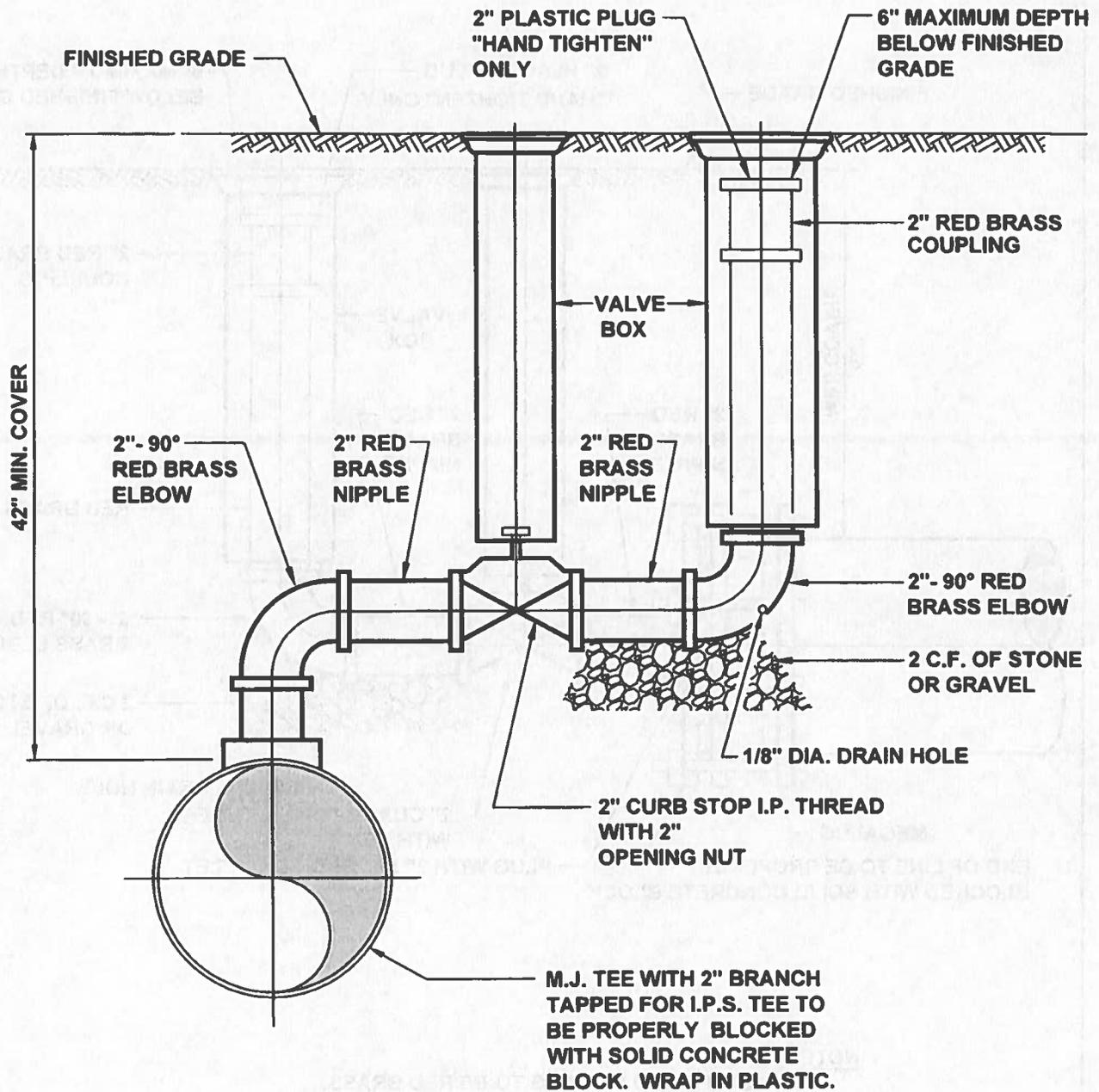
<p>PREPARED FOR: Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY: KLH ENGINEERS INC 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax 412-494-0426 info@klhengineers.com</p>	<p>90° FIRE HYDRANT ASSEMBLY DETAIL (AS SHOWN OR OPPOSITE HAND)</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-010</p>



NOTES:

1. ALL PIPE AND FITTINGS TO BE RED BRASS.
2. PLACE 2 CUBIC FEET OF STONE UNDER DRAIN HOLE.

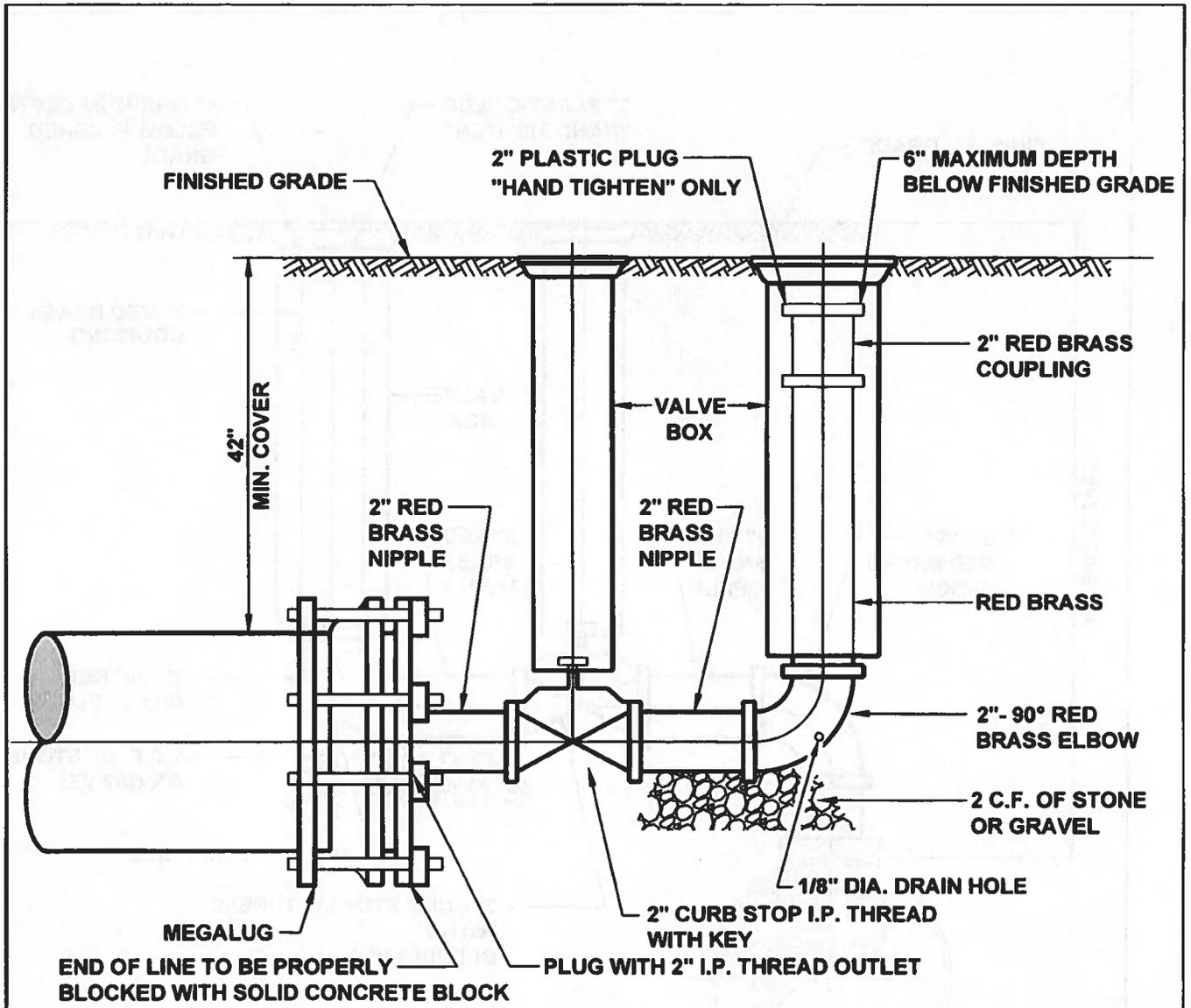
PREPARED FOR Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania	PREPARED BY KLH ENGINEERS, INC. 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax 412-494-0425 info@klhengineers.com	TYPICAL SIDE BLOW-OFF
Not to scale	September 2023	Standard Detail SD-011



NOTES:

1. ALL PIPE AND FITTINGS TO BE RED BRASS.
2. PLACE 2 CUBIC FEET OF STONE UNDER DRAIN HOLE.

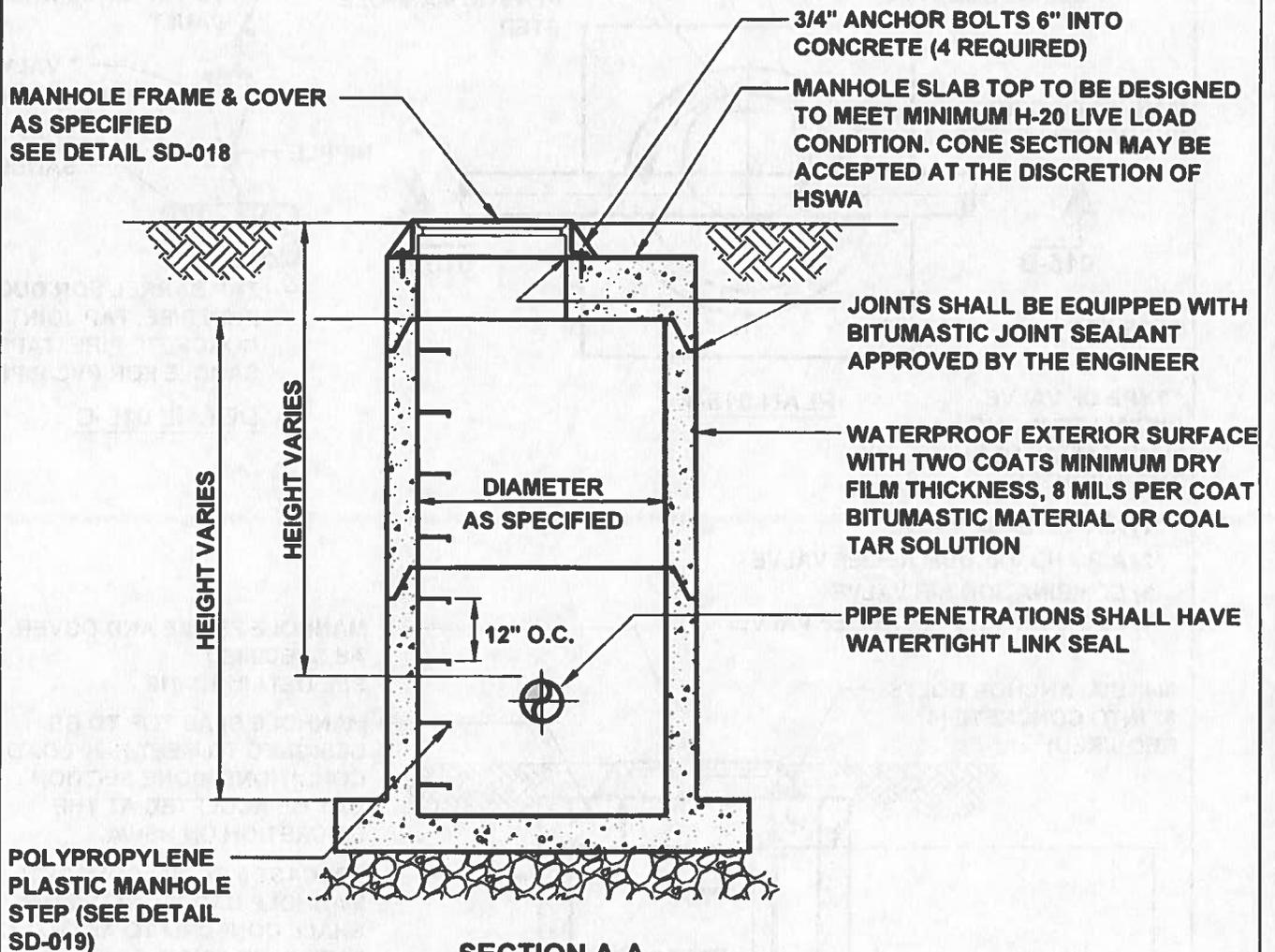
<p>PREPARED FOR Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>DESIGNED BY KLH ENGINEERS INC. 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 Fax: 412-494-0426 info@klhengineers.com</p>	<p>TYPICAL BLOW-OFF</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-012</p>



NOTE:

1. ALL PIPE AND FITTINGS TO BE RED BRASS.
2. PLACE 2 CUBIC FEET OF STONE UNDER DRAIN HOLE.
3. ALL FITTINGS TO BE WRAPPED IN PLASTIC.

<p>PREPARED FOR Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY  5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-484-0510 - Fax 412-484-0426 info@klhengineers.com</p>	<p>TYPICAL END BLOW-OFF</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-013</p>

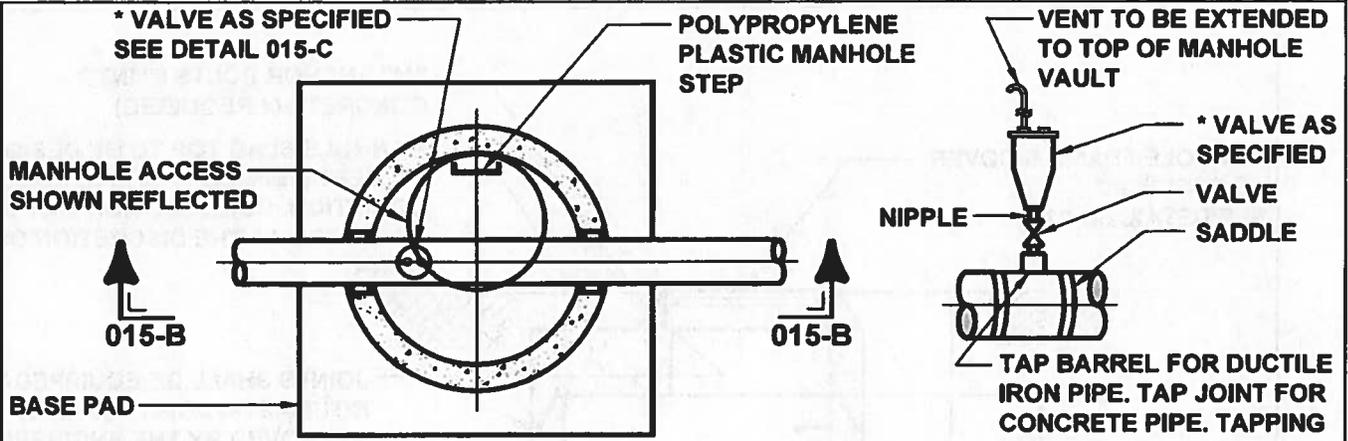


SECTION A-A

NOTES:

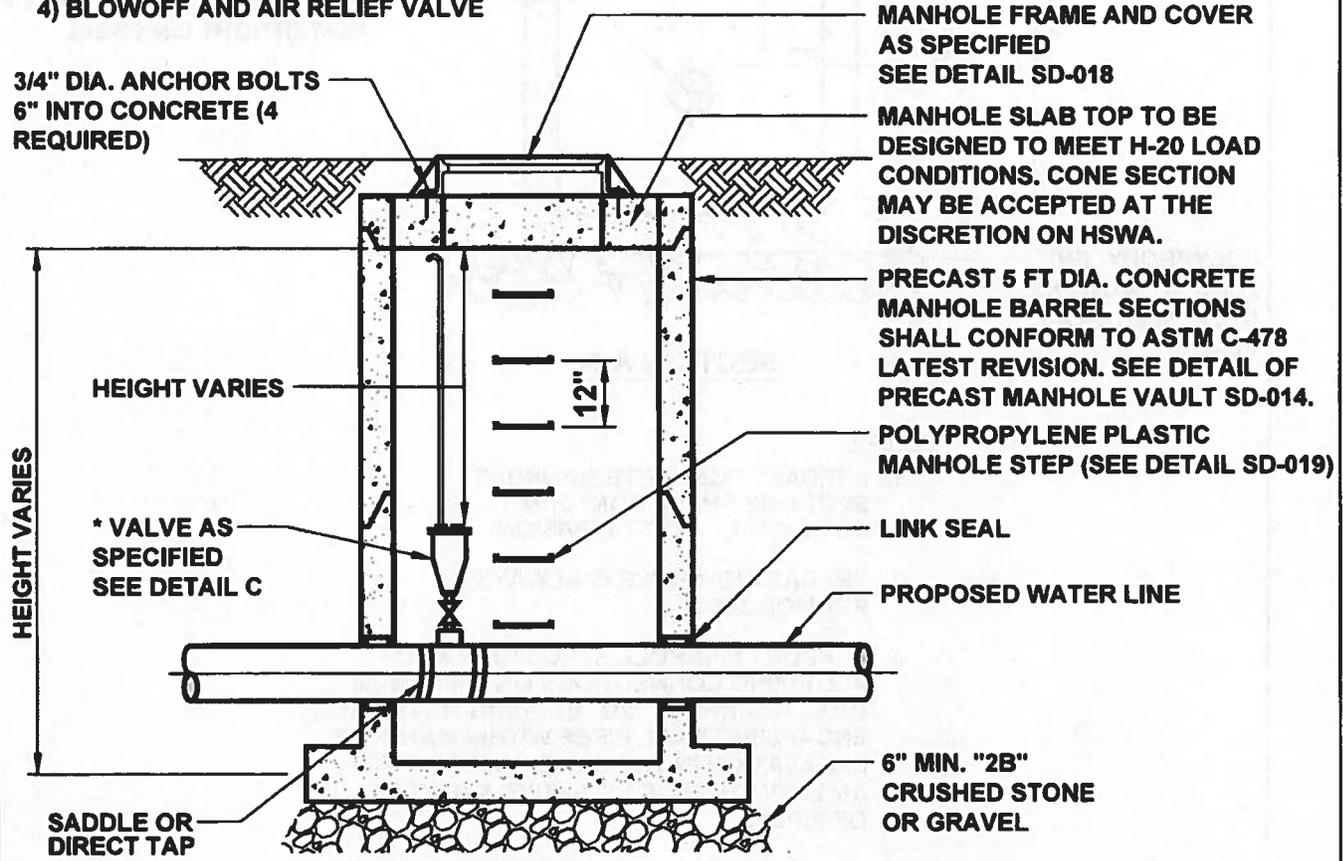
1. PRECAST CONCRETE MANHOLE SECTIONS SHALL CONFORM TO ASTM-C478, LATEST REVISION.
2. PRECAST MANHOLE IS ALWAYS REINFORCED
3. SUPPORT MANHOLE STRUCTURE AND ALL PIPING CONNECTIONS ON A MINIMUM OF 6" THICKNESS "2B" BEDDING MATERIAL. ENCAPSULATE ALL PIPES WITHIN MANHOLE EXCAVATION IN THE SAME MATERIAL TO AN ELEVATION OF 12" ABOVE THE TOPS OF PIPES.

<p>PREPARED FOR: Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY: KLH ENGINEERS INC. 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com</p>	<p>PRECAST CONCRETE MANHOLE VAULT</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-014</p>



* TYPE OF VALVE INSTALLED IN THE MANHOLE AS REQUIRED BY THE ENGINEER:

- 1) AIR RELEASE VALVE
- 2) AIR AND VACUUM RELIEF VALVE
- 3) COMBINATION AIR VALVE
- 4) BLOWOFF AND AIR RELIEF VALVE



SECTION 015-B

PREPARED FOR:
**Hampton Shaler
 Water Authority**
 3101 McCully Rd
 Allison Park, Pa 15101
 Allegheny County, Pennsylvania

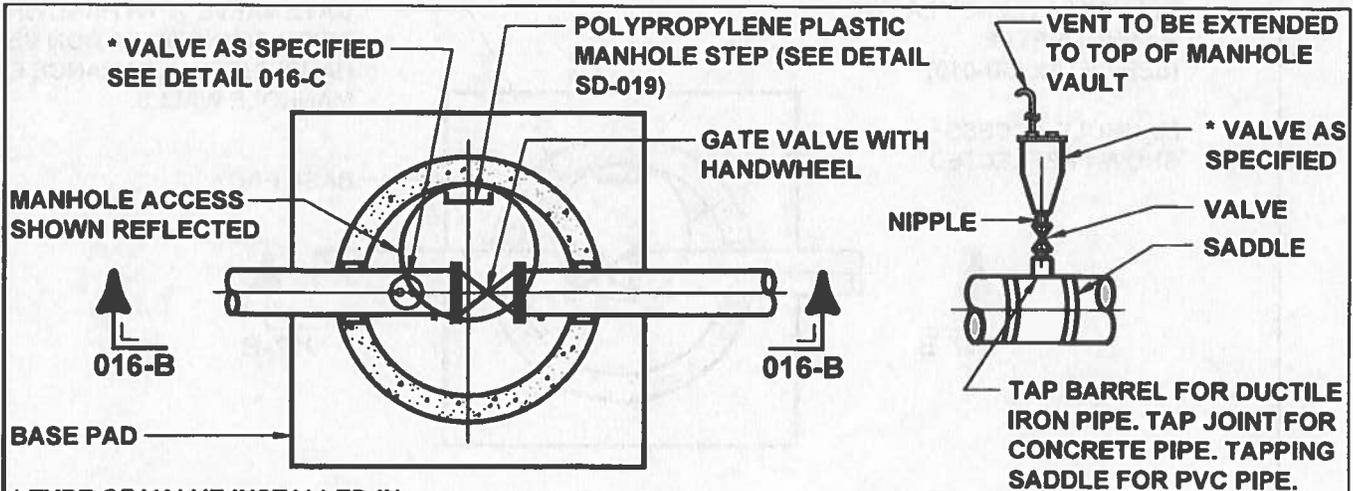
Not to scale

PREPARED BY:
KLH
 ENGINEERS, INC.
 5173 Campbells Run Road
 Pittsburgh, Pa 15205
 Phone: 412-494-0510 • Fax: 412-494-0426
 info@klhengineers.com

September 2023

**WATER AIR RELEASE OR
 AIR AND VACUUM VALVE
 IN MANHOLE VAULT**

Standard Detail SD-015



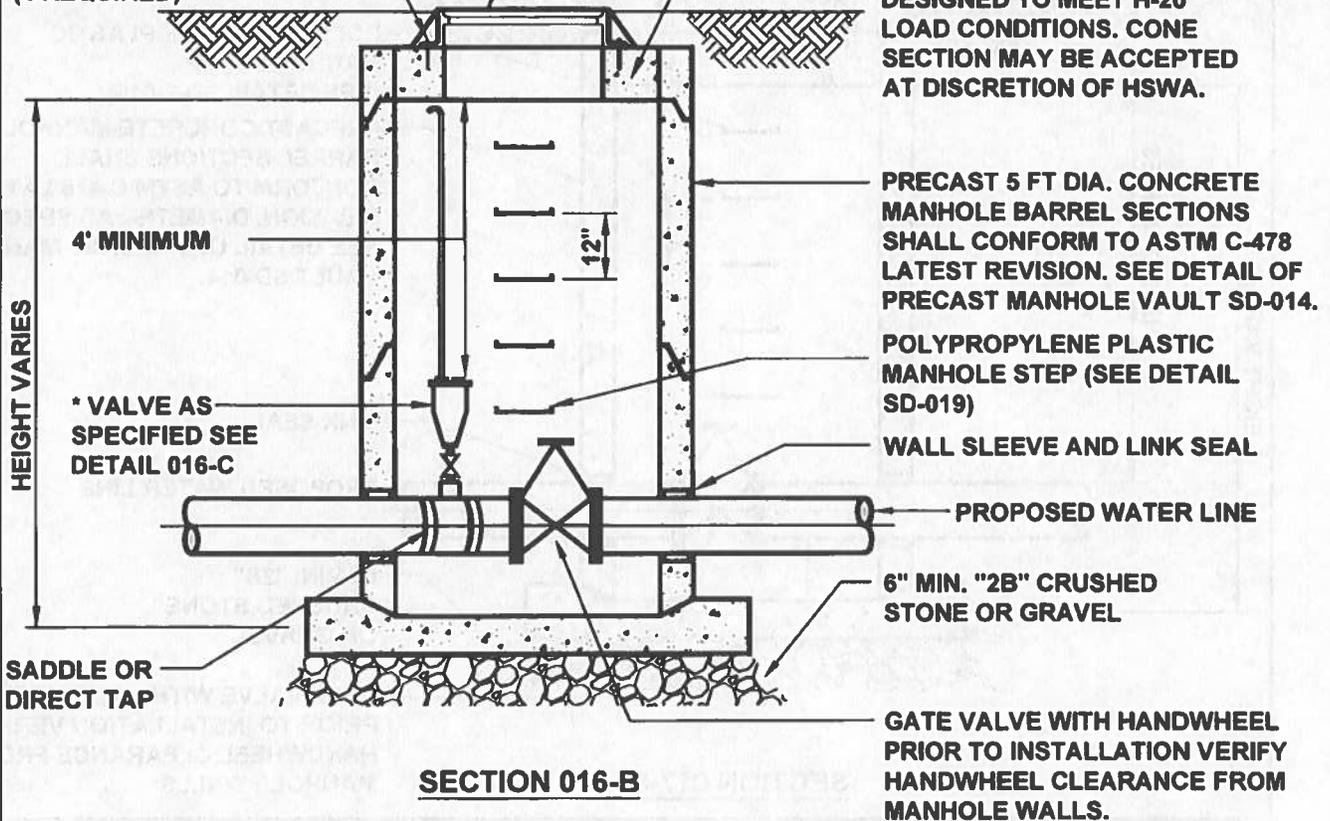
DETAIL 016-C

* TYPE OF VALVE INSTALLED IN THE MANHOLE AS REQUIRED BY THE ENGINEER:

- 1) AIR RELEASE VALVE
- 2) AIR AND VACUUM RELIEF VALVE
- 3) COMBINATION AIR VALVE
- 4) BLOWOFF AND AIR RELIEF VALVE

PLAN 016-A

3/4" DIA. ANCHOR BOLTS 6" INTO CONCRETE (4 REQUIRED)



SECTION 016-B

<p>PREPARED FOR:</p> <p>Hampton Shaler Water Authority</p> <p>3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY:</p> <p>KLH ENGINEERS INC.</p> <p>5173 Campbells Run Road Pittsburgh, Pa 15205 Phone: 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com</p>	<p>WATER SYSTEM MAIN VALVE AND WATER AIR RELEASE OR AIR AND VACUUM VALVE IN MANHOLE VAULT</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-016</p>

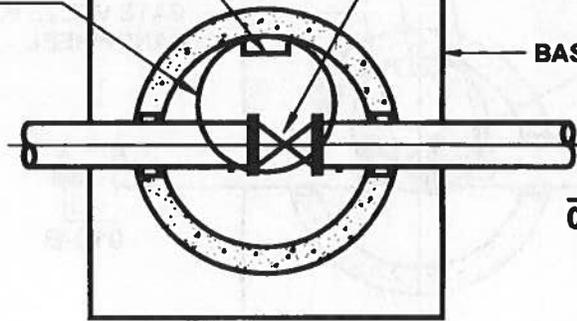
POLYPROPYLENE PLASTIC
MANHOLE STEP
(SEE DETAIL SD-019)

GATE VALVE WITH HANDWHEEL
PRIOR TO INSTALLATION VERIFY
HANDWHEEL CLEARANCE FROM
MANHOLE WALLS.

MANHOLE ACCESS
SHOWN REFLECTED

BASE PAD

017-B



017-B

PLAN 017-A

MANHOLE FRAME AND
COVER AS SPECIFIED
SEE DETAIL SD-018

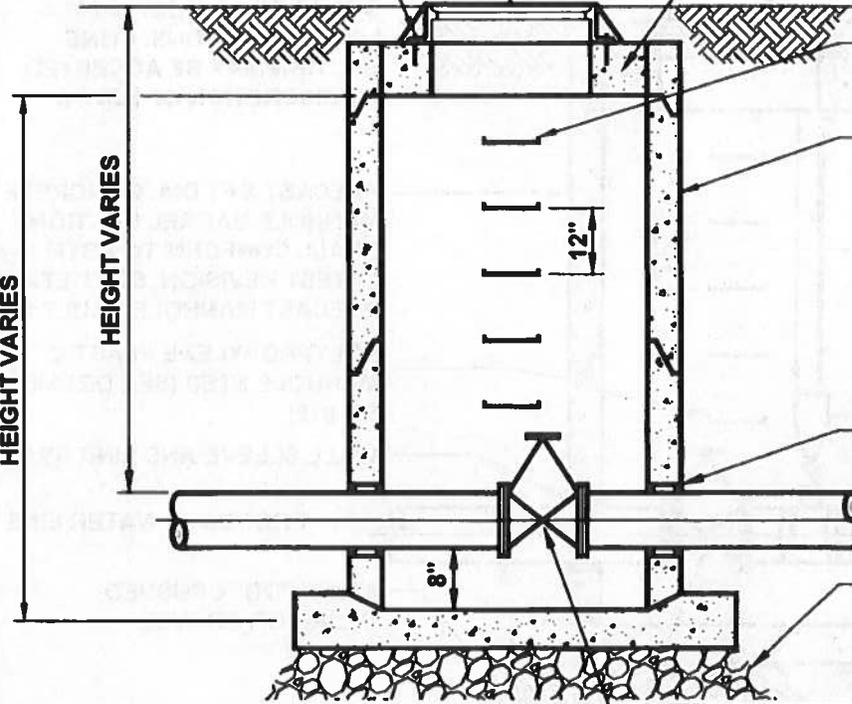
MANHOLE SLAB TOP TO BE
DESIGNED TO MEET H-20
LOAD CONDITIONS.
CONE SECTION MAY BE
ACCEPTED AT DISCRETION
OF HSWA.

3/4" DIA. ANCHOR BOLTS
6" INTO CONCRETE
(4 REQUIRED)

HEIGHT VARIES

POLYPROPYLENE PLASTIC
MANHOLE STEP
(SEE DETAIL SD-2-019)

PRECAST CONCRETE MANHOLE
BARREL SECTIONS SHALL
CONFORM TO ASTM C-478 LATEST
REVISION. DIAMETER AS SPECIFIED.
SEE DETAIL OF PRECAST MANHOLE
VAULT SD-014.



LINK SEAL

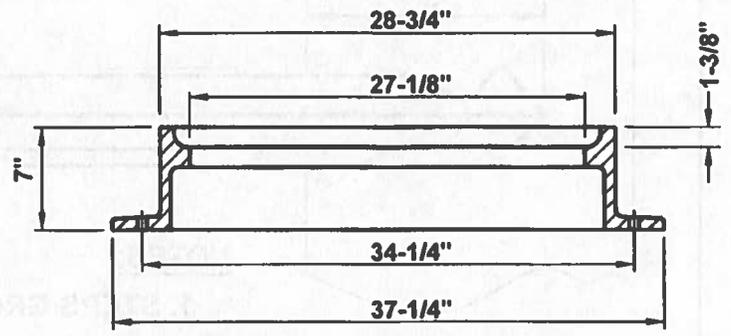
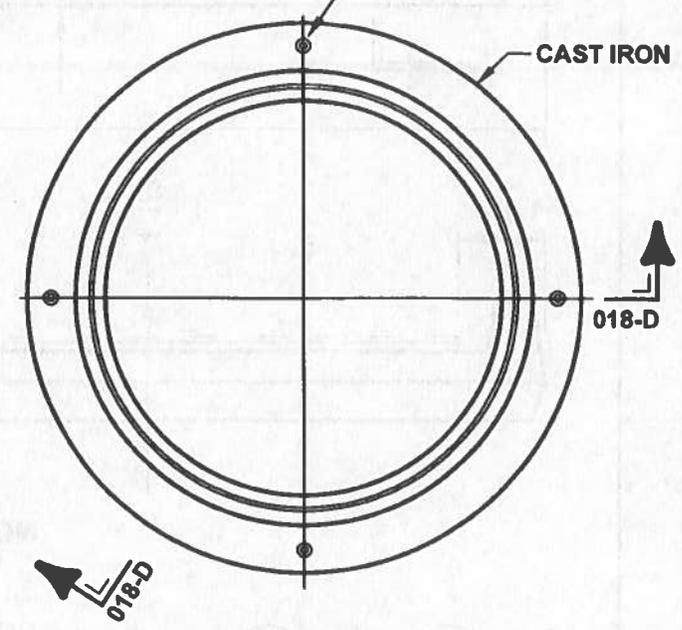
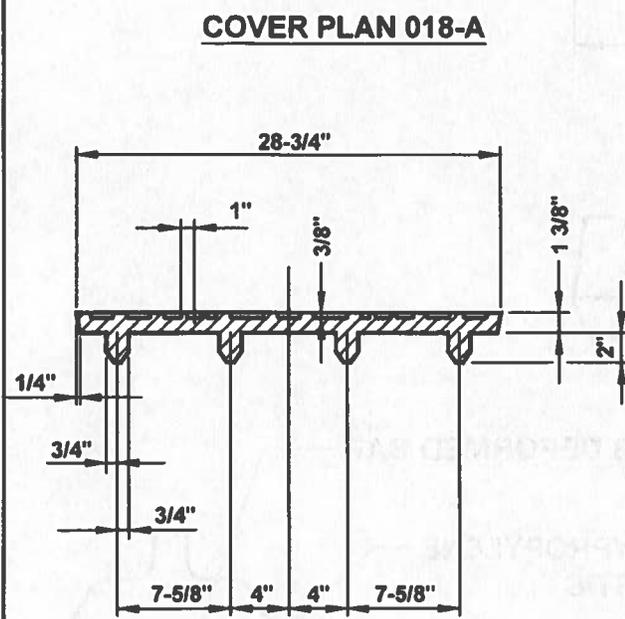
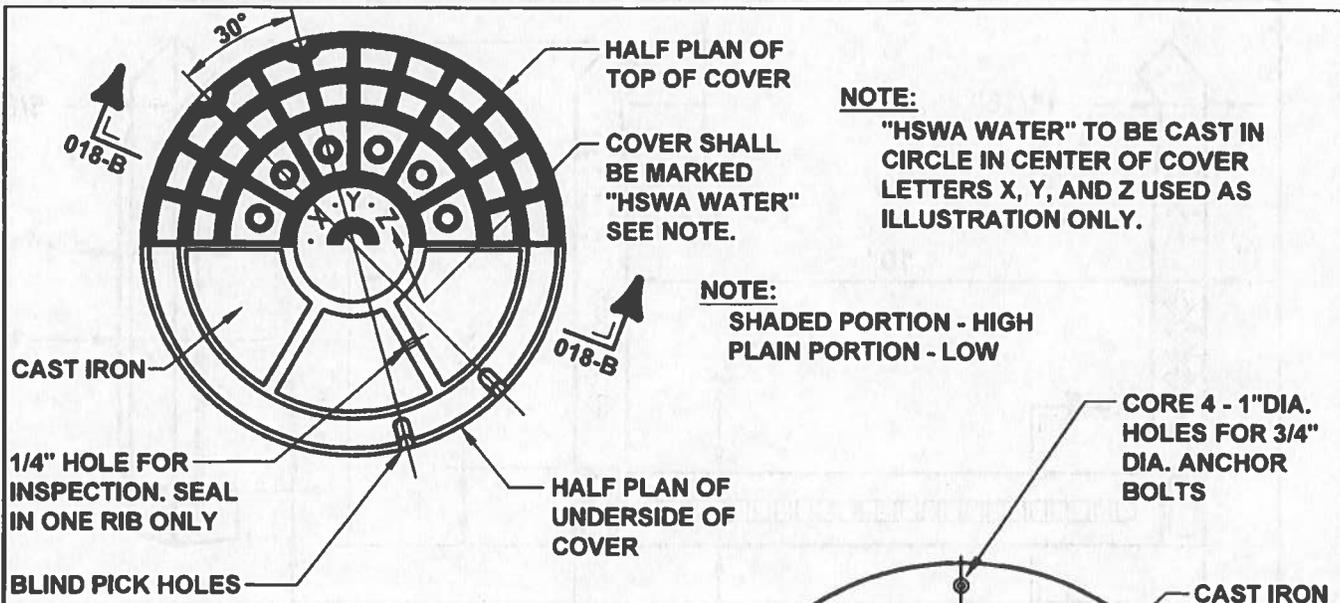
PROPOSED WATER LINE

6" MIN. "2B"
CRUSHED STONE
OR GRAVEL

GATE VALVE WITH HANDWHEEL
PRIOR TO INSTALLATION VERIFY
HANDWHEEL CLEARANCE FROM
MANHOLE WALLS.

SECTION 017-B

<p>PREPARED FOR Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY KLH ENGINEERS, INC. 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone: 412-494-0510 • Fax: 412-494-0426 info@klhengineers.com</p>	<p>WATER SYSTEM MAIN VALVE IN MANHOLE VAULT</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-017</p>



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 Water Authority**
 3101 McCully Rd
 Allison Park, Pa 15101
 Allegheny County, Pennsylvania

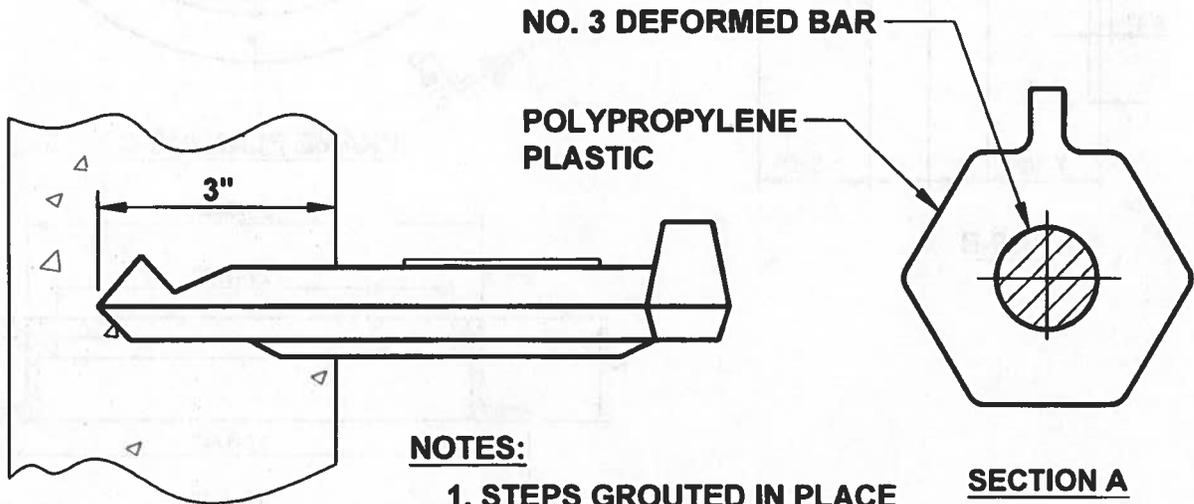
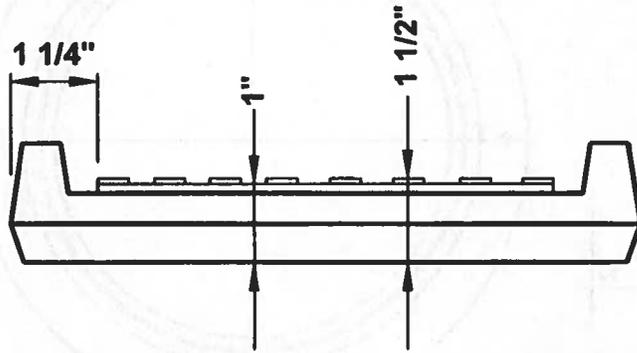
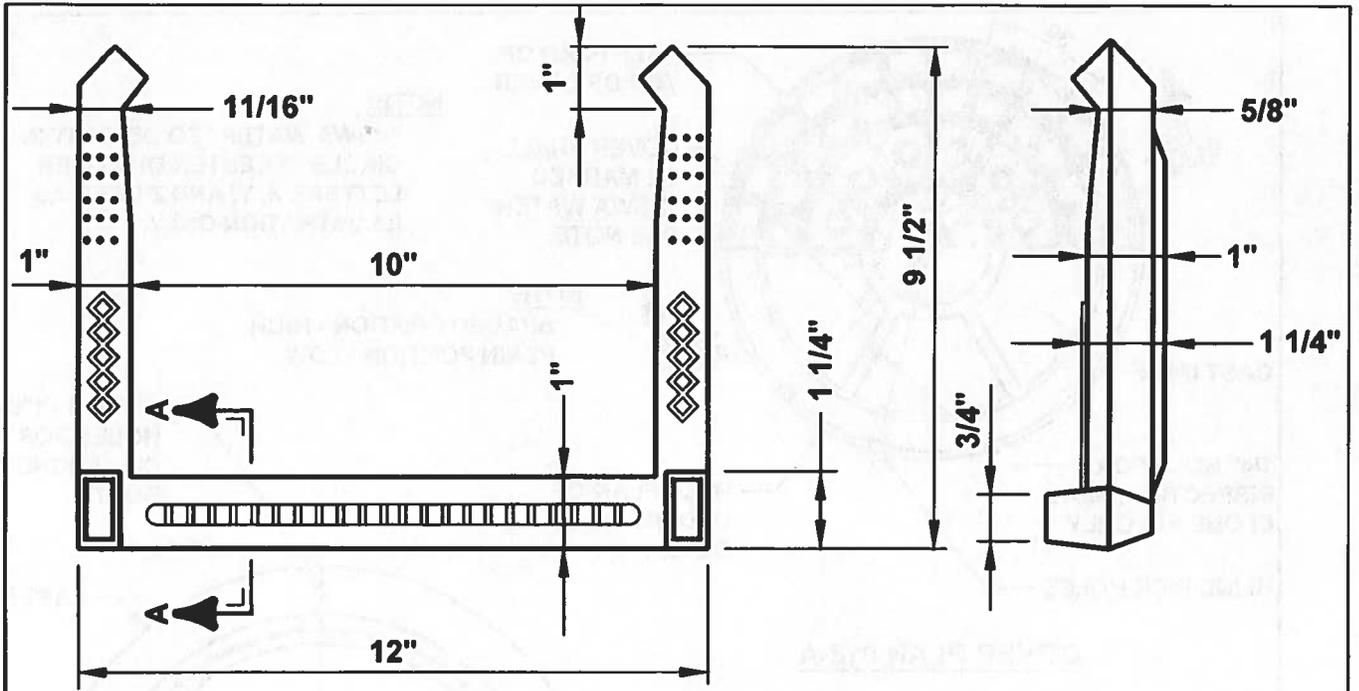
PREPARED BY:
KLH
 ENGINEERS INC
 5173 Campbells Run Road
 Pittsburgh, Pa 15205
 Phone 412-494-0510 - Fax 412-494-0426
 info@klhengineers.com

**STANDARD
 CAST IRON MANHOLE
 FRAME AND COVER**

Not to scale

September 2023

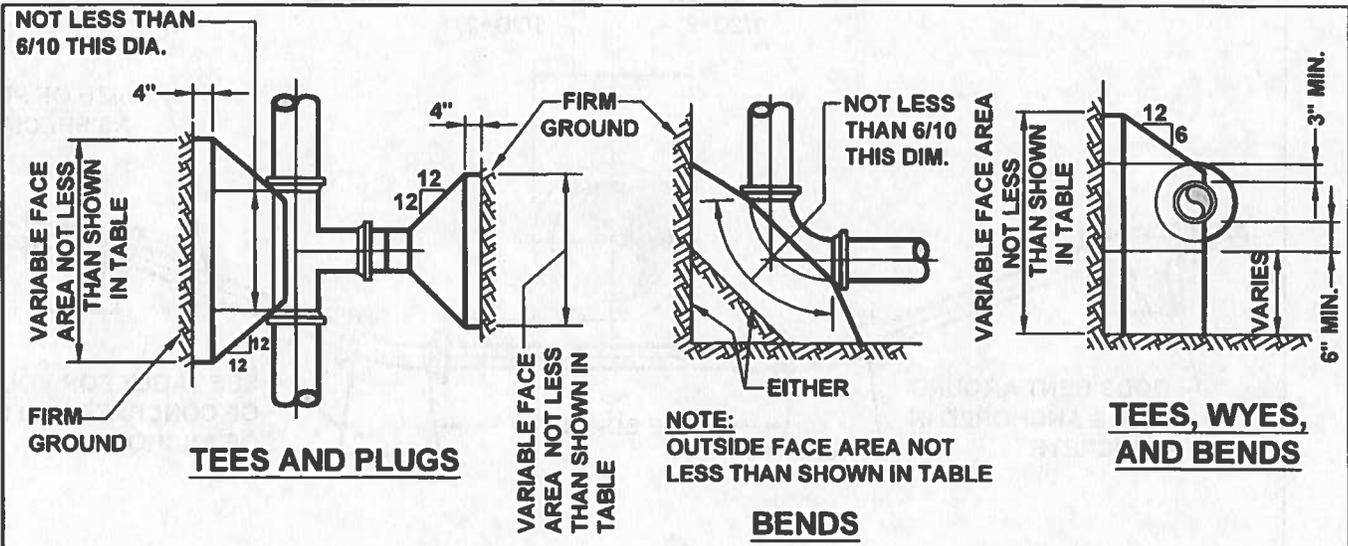
Standard Detail SD-018



NOTES:

1. STEPS GROUTED IN PLACE
2. INSTALL STEPS ON 12" C:C

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<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-019</p>



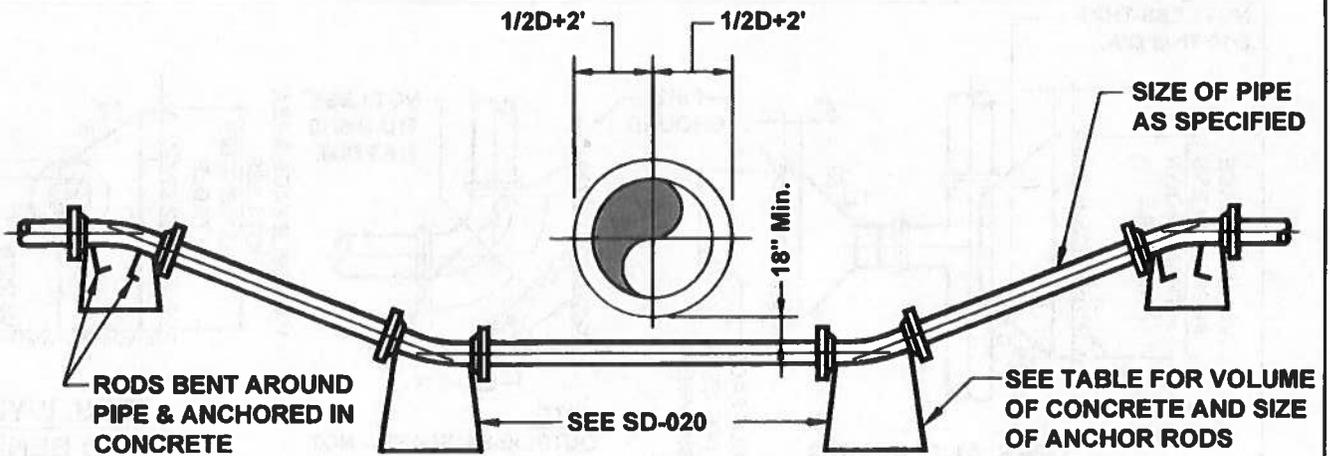
NOTES:

1. ALL TEES, WYES, CROSSES, PLUGS AND BENDS OF 10° OR MORE SHALL BE BLOCKED AGAINST FIRM EARTH WITH SOLID CONCRETE BLOCK AND HARDWOOD WEDGES.
2. EARTH PRESSURE FIGURED AT 4000 PSF. IF EARTH ENCOUNTERED WILL NOT WITHSTAND THIS PRESSURE, THE AREA OF THE BLOCK MUST BE INCREASED PROPORTIONATELY.
3. ALL FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO SETTING SOLID CONCRETE BLOCKS.

PIPE SIZE (in)	AREA* (sq in)	TOTAL FORCE (lbs)	AREA OF BLOCK IN SQUARE FEET				
			TEES & PLUGS	90 DEGREE BENDS	45 DEGREE BENDS	22 1/2 DEGREE BENDS	11 1/4 DEGREE BENDS
4	19	4,275	1.1	1.5	1.0	1.0	1.0
6	38	8,550	2.2	3.0	1.6	1.0	1.0
8	65	14,625	3.7	5.2	2.8	1.4	1.0
10	97	21,825	5.5	7.7	4.2	2.1	1.1
12	137	30,825	7.7	10.9	5.9	3.0	1.5
14	184	41,400	10.4	14.6	7.9	4.0	2.1
16	238	53,550	13.4	18.9	10.3	5.2	2.7
20	367	82,575	20.7	29.2	15.8	8.1	4.1
24	523	117,675	29.4	41.6	22.5	11.5	5.9

CALCULATIONS ARE BASED ON 225 PSI PRESSURE OR 150 PSI WORKING PRESSURE PLUS 50% INCREASE FOR WATER HAMMER FOR SIZES 4" TO 24" INCLUSIVE. FOR SIZES 30" & 36" THE TABLE IS BASED ON 120 PSI PRESSURE OR 75 PSI WORKING PRESSURE PLUS 50% WATER HAMMER.

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Not to scale	September 2023	Standard Detail SD-020



NOTE:
 THE TABLE IS BASED ON 225 PSI TEST PRESSURE. ALL BLOCKS HAVING LENGTH OF 3'-0" OR MORE TO BE REINFORCED WITH #4 @ 6" PLACED 3" FROM TOP OF BLOCK.

NOTE:
 ALL FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO POURING CONCRETE ANCHORS.

PIPE SIZE	TOTAL FORCE (lbs)	VOLUME IN CUBIC FEET			SIZE AND NO. OF ANCHOR RODS		
		45 DEGREE BENDS	22 1/2 DEGREE BENDS	11 1/4 DEGREE BENDS	45 DEGREE BENDS	22 1/2 DEGREE BENDS	11 1/4 DEGREE BENDS
4	4275	22.7	11.6	5.9	1-#4	1-#4	1-#4
6	8550	45.5	23.3	11.9	2-#4	1-#4	1-#4
8	14625	77.8	39.6	20.3	2-#4	2-#4	1-#4
10	21825	116.1	59.1	30.3	2-#4	2-#4	2-#4
12	30825	164.0	83.5	42.8	2-#5	2-#4	2-#4
14	41400	220.2	112.1	57.5	2-#6	2-#4	2-#4
16	53550	284.9	145.0	73.4	2-#7	2-#5	2-#4
20	82575	439.2	223.6	114.7	2-#8	2-#6	2-#4
24	117675	626.0	318.7	183.4	2-#9	2-#7	2-#5

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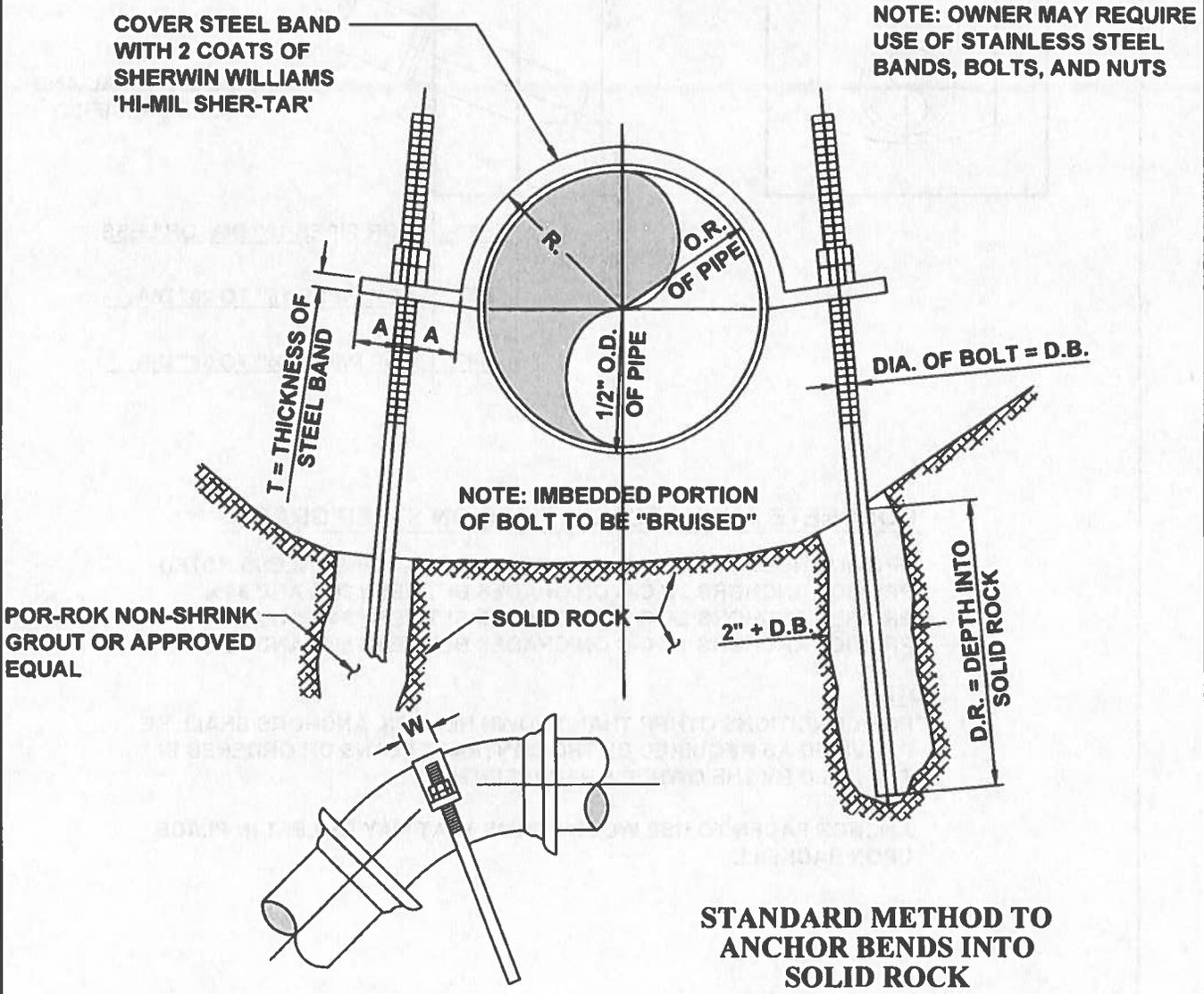
**CONCRETE ANCHORS AND
 METHOD OF LAYING MAINS
 UNDER OBSTRUCTIONS**

Not to scale

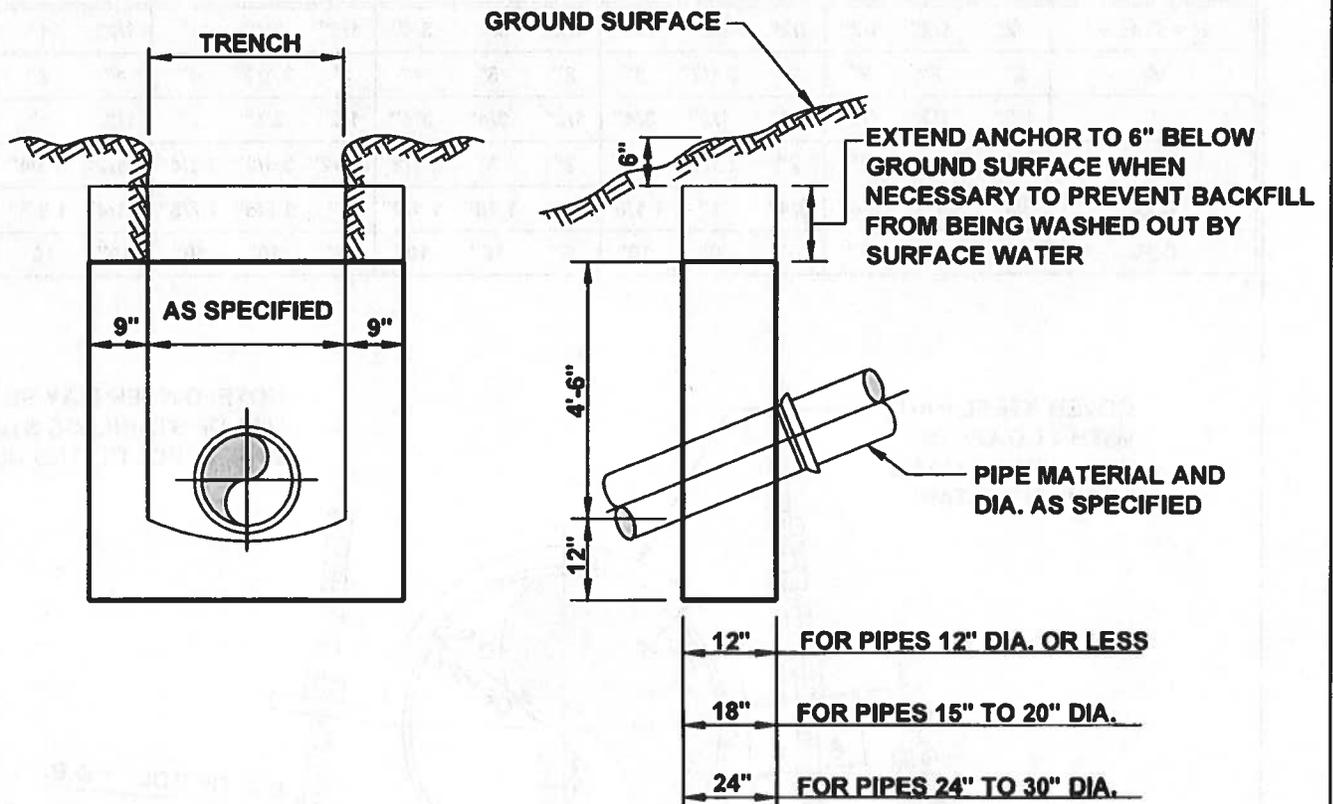
September 2023

Standard Detail SD-021

SIZE OF PIPE	4", 6", 8"			10" & 12"			14" & 16"			18" & 20"			24"		
DEGREE BEND	22½°	45°	90°	22½°	45°	90°	22½°	45°	90°	22½°	45°	90°	22½°	45°	90°
R = O.R.+	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	1/2"	3/4"	3/4"	1/2"	3/4"	1"	1/2"	1"	1"
W	2"	2"	2"	2"	2 1/2"	3"	2"	3"	4"	3"	3 1/2"	4"	4"	4"	4"
T	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	1/2"	3/4"	3/4"	1/2"	3/4"	1"	1/2"	1"	1"
A	2"	2"	2"	2"	2 1/2"	3"	2"	3"	3 1/2"	2 1/2"	3 1/2"	3 3/4"	3 1/2"	3 3/4"	4"
D.B.	3/4"	3/4"	3/4"	3/4"	1"	1 1/8"	3/4"	1 1/8"	1 1/2"	1"	1 3/8"	1 7/8"	1 1/4"	1 5/8"	2"
D.R.	6"	6"	6"	6"	8"	10"	6"	10"	10"	8"	10"	10"	10"	10"	10"



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Not to scale	September 2023	Standard Detail SD-022



CONCRETE ANCHORS FOR PIPES ON STEEP GRADES

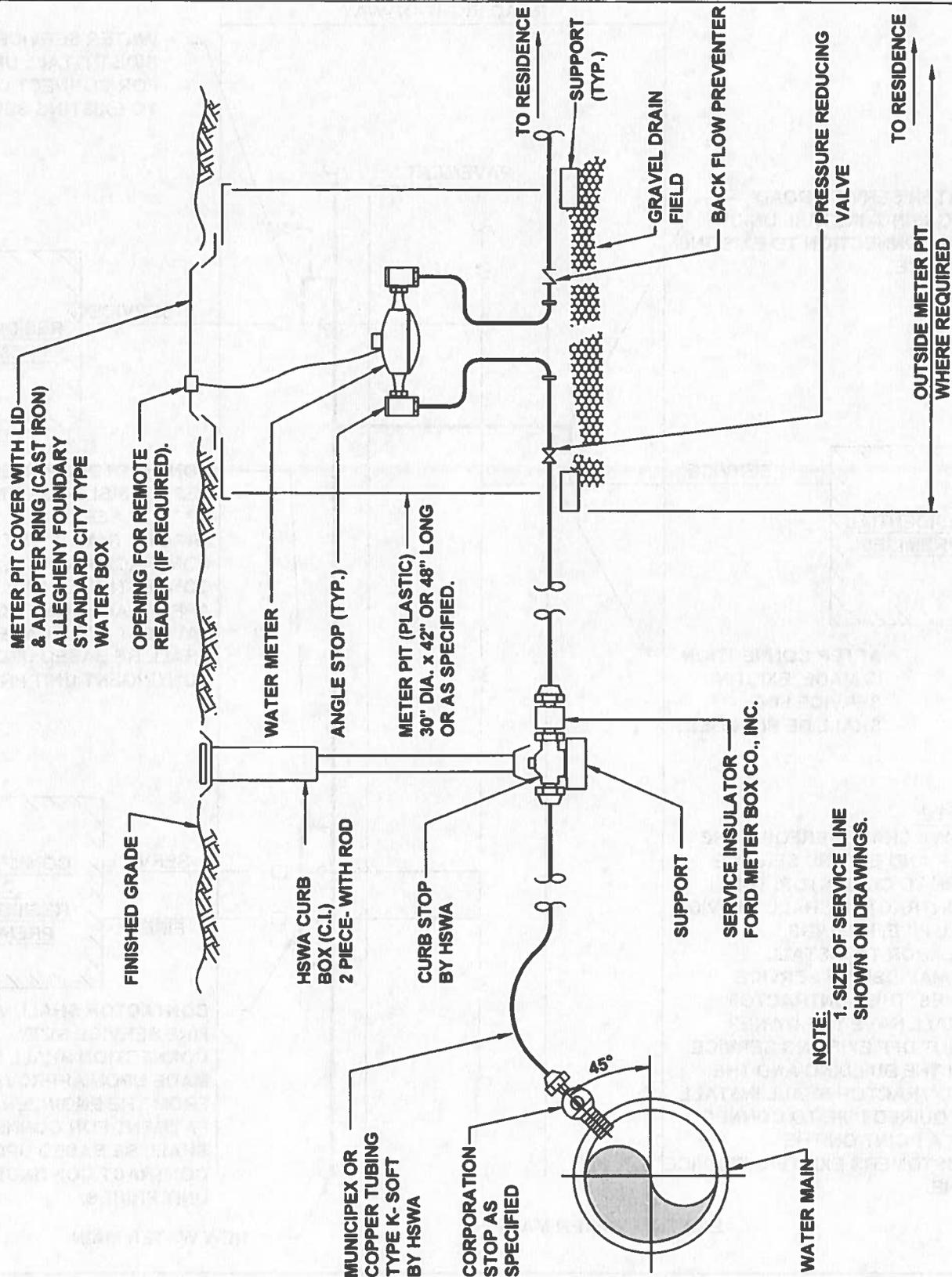
PROVIDE NO ANCHORS ON GRADES LESS THAN 20% UNLESS NOTED
 PROVIDE ANCHORS 36' C-C ON GRADES BETWEEN 20% AND 34%
 PROVIDE ANCHORS 24' C-C ON GRADES BETWEEN 34% AND 50%
 PROVIDE ANCHORS 16' C-C ON GRADES BETWEEN 50% AND 70%

NOTE:

FOR CONDITIONS OTHER THAN SHOWN HEREON, ANCHORS SHALL BE PROVIDED AS REQUIRED BY THE CONTRACT PLANS OR ORDERED IN THE FIELD BY THE OWNER'S REPRESENTATIVE.

ANCHOR FACES TO USE WOOD FORMS THAT MAY BE LEFT IN PLACE UPON BACKFILL

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<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-023</p>



NOTE:
1. SIZE OF SERVICE LINE SHOWN ON DRAWINGS.

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Allegheny County, Pennsylvania

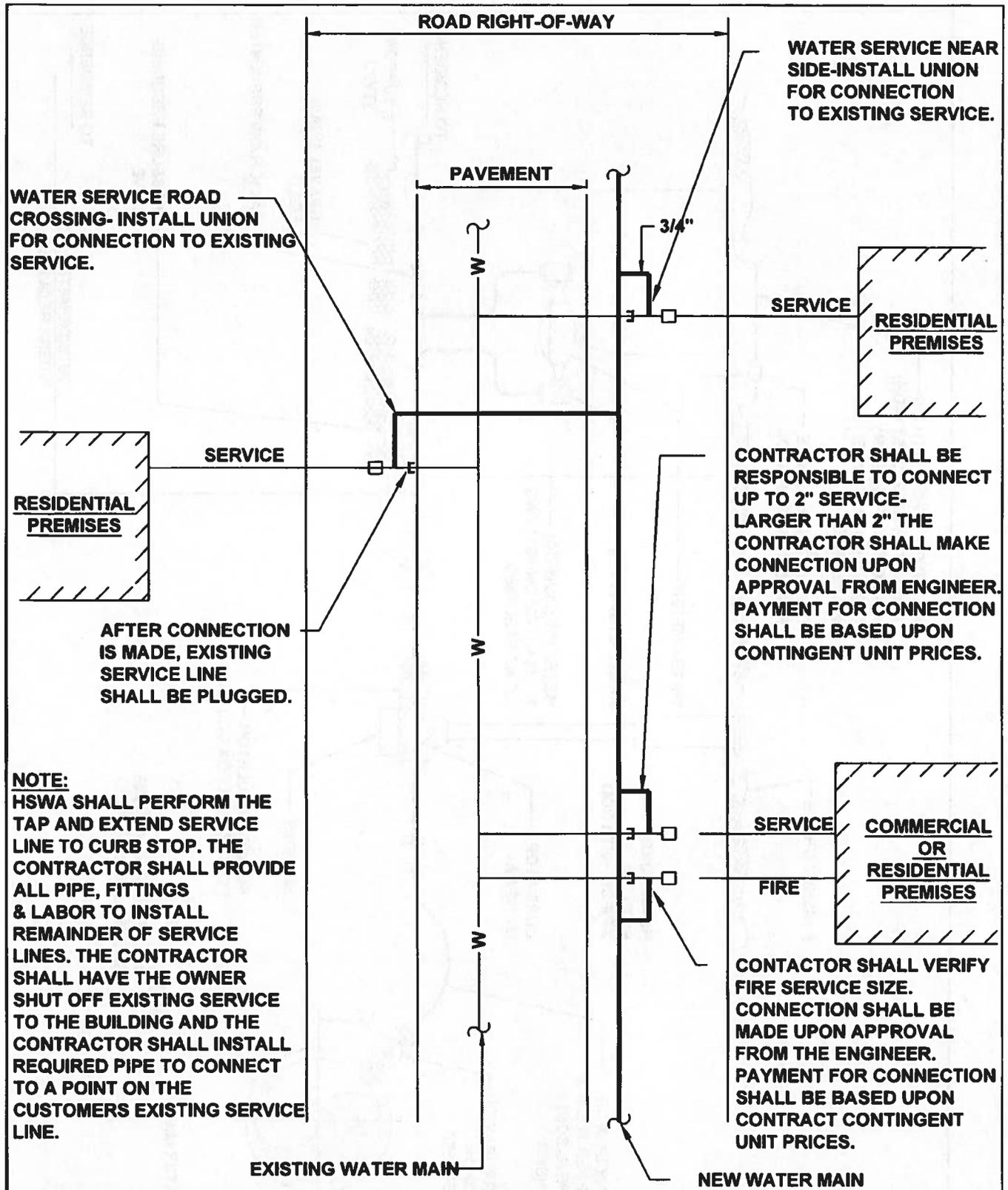
PREPARED BY:
KLH
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Pittsburgh, Pa 15205
Phone 412-494-0510 - Fax: 412-494-0426
mjo@klhengineers.com

**TYPICAL CONNECTION FOR
WATER SERVICE**

Not to scale

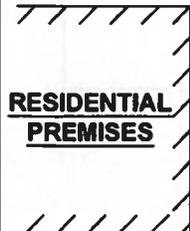
September 2023

Standard Detail SD-024



WATER SERVICE ROAD CROSSING- INSTALL UNION FOR CONNECTION TO EXISTING SERVICE.

WATER SERVICE NEAR SIDE-INSTALL UNION FOR CONNECTION TO EXISTING SERVICE.



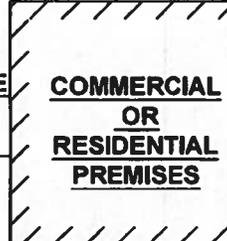
SERVICE

RESIDENTIAL PREMISES

AFTER CONNECTION IS MADE, EXISTING SERVICE LINE SHALL BE PLUGGED.

CONTRACTOR SHALL BE RESPONSIBLE TO CONNECT UP TO 2" SERVICE- LARGER THAN 2" THE CONTRACTOR SHALL MAKE CONNECTION UPON APPROVAL FROM ENGINEER. PAYMENT FOR CONNECTION SHALL BE BASED UPON CONTINGENT UNIT PRICES.

NOTE:
 HSWA SHALL PERFORM THE TAP AND EXTEND SERVICE LINE TO CURB STOP. THE CONTRACTOR SHALL PROVIDE ALL PIPE, FITTINGS & LABOR TO INSTALL REMAINDER OF SERVICE LINES. THE CONTRACTOR SHALL HAVE THE OWNER SHUT OFF EXISTING SERVICE TO THE BUILDING AND THE CONTRACTOR SHALL INSTALL REQUIRED PIPE TO CONNECT TO A POINT ON THE CUSTOMERS EXISTING SERVICE LINE.



SERVICE

COMMERCIAL OR RESIDENTIAL PREMISES

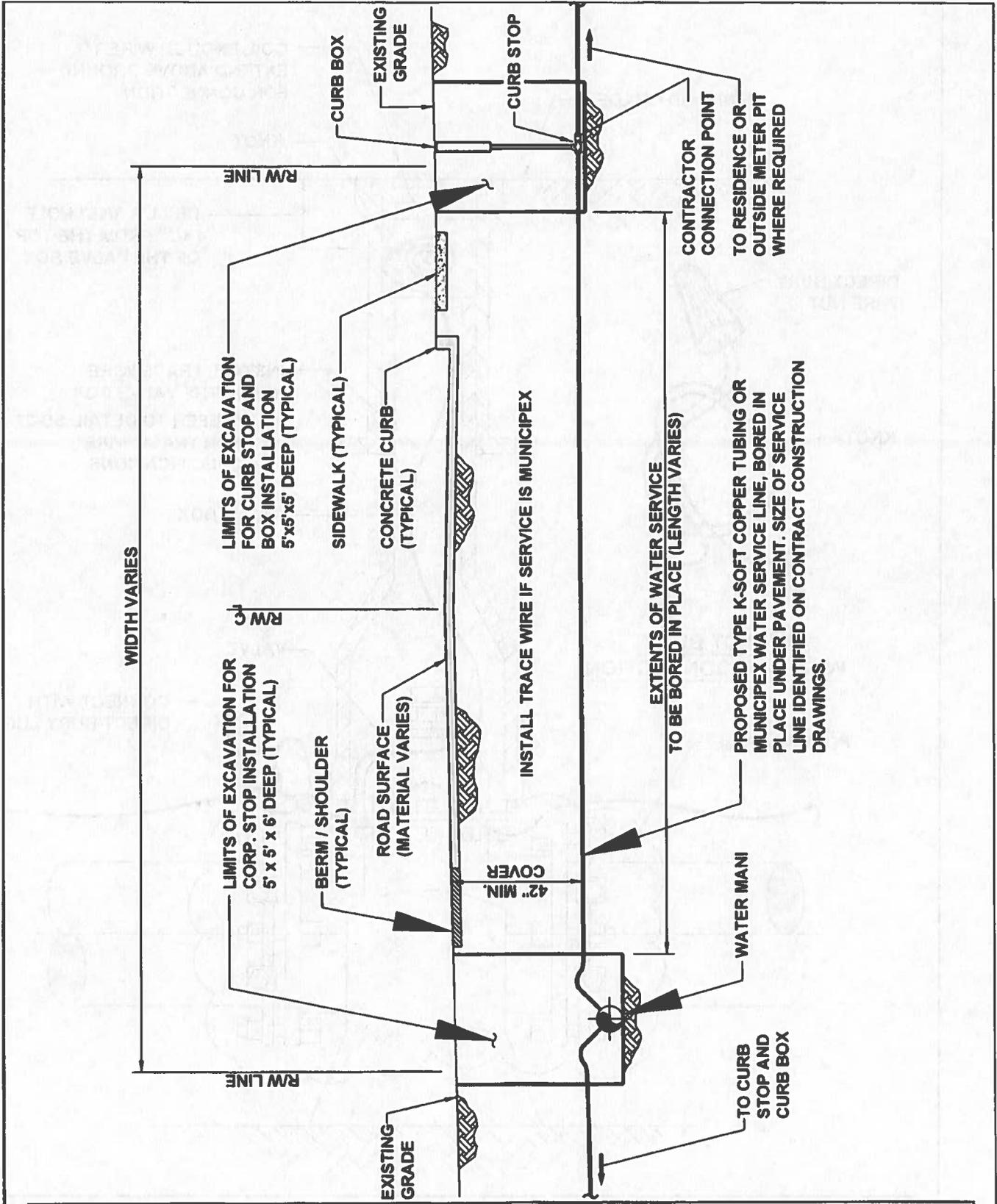
FIRE

CONTRACTOR SHALL VERIFY FIRE SERVICE SIZE. CONNECTION SHALL BE MADE UPON APPROVAL FROM THE ENGINEER. PAYMENT FOR CONNECTION SHALL BE BASED UPON CONTRACT CONTINGENT UNIT PRICES.

EXISTING WATER MAIN

NEW WATER MAIN

<p>PREPARED FOR: Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY: KLH ENGINEERS, INC. 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com</p>	<p>TYPICAL WATER SERVICE LINE REPLACEMENT</p> <p>Standard Detail SD-025</p>
<p>Not to scale</p>	<p>September 2023</p>	



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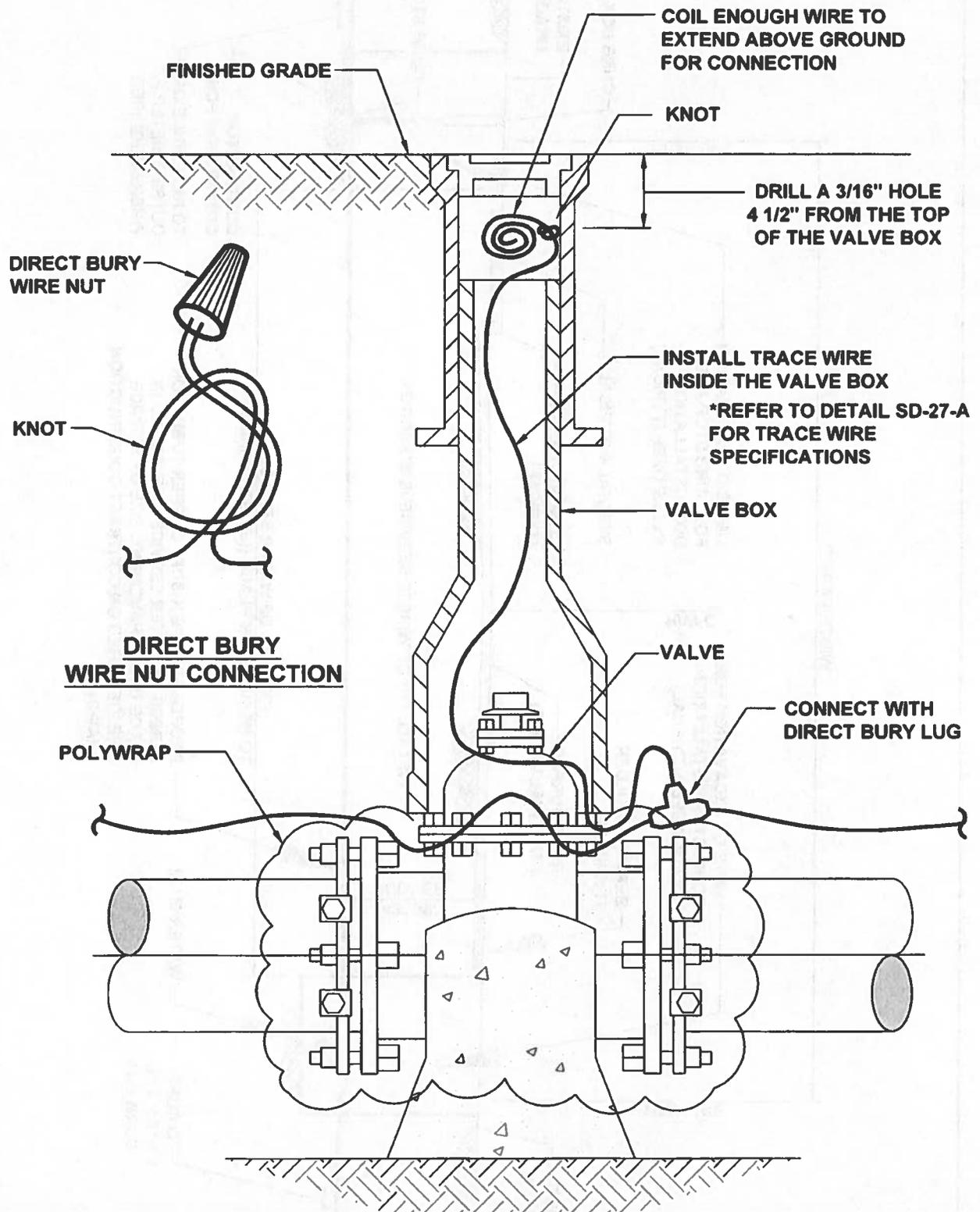
PREPARED BY
KLH
 ENGINEERS INC
 5173 Campbells Run Road
 Pittsburgh, Pa 15205
 Phone 412-494-0510 - Fax: 412-494-0426
 info@klhengineers.com

**TYPICAL CONNECTION FOR PROPOSED
 WATER SERVICE INSTALLATION
 BORED UNDER ROAD PAVEMENT**

Not to scale

September 2023

Standard Detail SD-026



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 Water Authority**
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 Allegheny County, Pennsylvania

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**VALVE BOX TRACE WIRE
 DETAIL**

1 OF 2

Standard Detail SD-027

APPROVED TRACE WIRE MATERIAL:

TRACE WIRE FOR DIRECT BURY INSTALLATIONS SHALL BE #12 AWG SOLID COPPER WIRE WITH A 30 MIL HIGH DENSITY POLYETHYLENE (HDPE) OR HIGH MOLECULAR WEIGHT POLYETHYLENE (HMWPE) COATING DESIGNED FOR DIRECT BURIAL. COLOR SHALL BE BLUE.

DIRECT BURY WIRE NUTS (DRYCONN DBSR AQUA MANUFACTURED BY KING INNOVATION OR APPROVED EQUAL).

DIRECT BURY LUG (DRYCONN DIRECT BURY LUG AQUA AS MANUFACTURED BY KING INNOVATION OR APPROVED EQUAL).

INSTALLATION:

TRACE WIRE SHALL BE INSTALLED IN A CONTINUOUS FASHION. INSTALL TRACE WIRE 6" ABOVE THE WATER MAIN. BRING TRACE WIRE TO SURFACE AT EVERY VALVE BOX. TRACE WIRE SHALL BE BROUGHT TO THE SURFACE AT LEAST EVERY FIVE HUNDRED (500) FEET. TAKE CARE NOT TO DAMAGE THE WIRE COATING. REPAIR DAMAGED COATING WITH ELECTRICAL TAPE.

TRACE WIRE CONNECTIONS:

JOINING ENDS OF TRACE WIRE:

CONNECTIONS INTO EXISTING TRACE WIRE, CONNECTIONS INTO TRACE WIRE USED DURING WATER MAIN BORES, CONNECTIONS BETWEEN ONE SPOOL OF TRACE WIRE TO ANOTHER, AND OTHER SIMILAR CONNECTIONS SHALL BE MADE USING A DIRECT BURY WIRE NUT. WHEN CONNECTING TRACE WIRE ENDS TOGETHER, STRIP 5/8" OF INSULATION FROM THE END OF EACH WIRE. INSERT THE TWO ENDS FIRMLY INTO THE DIRECT BURY WIRE NUT. TWIST THE WIRE NUT CLOCKWISE WHILE PUSHING THE WIRES FIRMLY INTO THE NUT. DO NOT OVER TORQUE. TIE THE WIRES IN A KNOT AS SHOWN IN THE DIRECT BURY WIRE NUT CONNECTION DETAIL ON SD-027.

JOINING THE TRACE WIRE - BRANCH TO MAIN:

CONNECTIONS OF TRACE WIRE AT TEES, CROSSES, AND AT LOCATIONS WHERE THE TRACE WIRE WILL BE BROUGHT TO THE SURFACE SHALL BE CONDUCTED USING A DIRECT BURY LUG.

TRACE WIRE IN A VALVE BOX:

TRACE WIRE SHALL BE BROUGHT UP IN ALL VALVE BOXES. THE TRACE WIRE SHALL BE BROUGHT TO THE SURFACE ACCORDING TO THE DETAIL ON DWG. SD-027.

TRACE WIRE AT HYDRANTS:

TRACE WIRE SHALL BE BROUGHT IN FIRE HYDRANTS BRANCH VALVES PER THE DETAIL ON SD-027.

TRACE WIRE AT SERVICES:

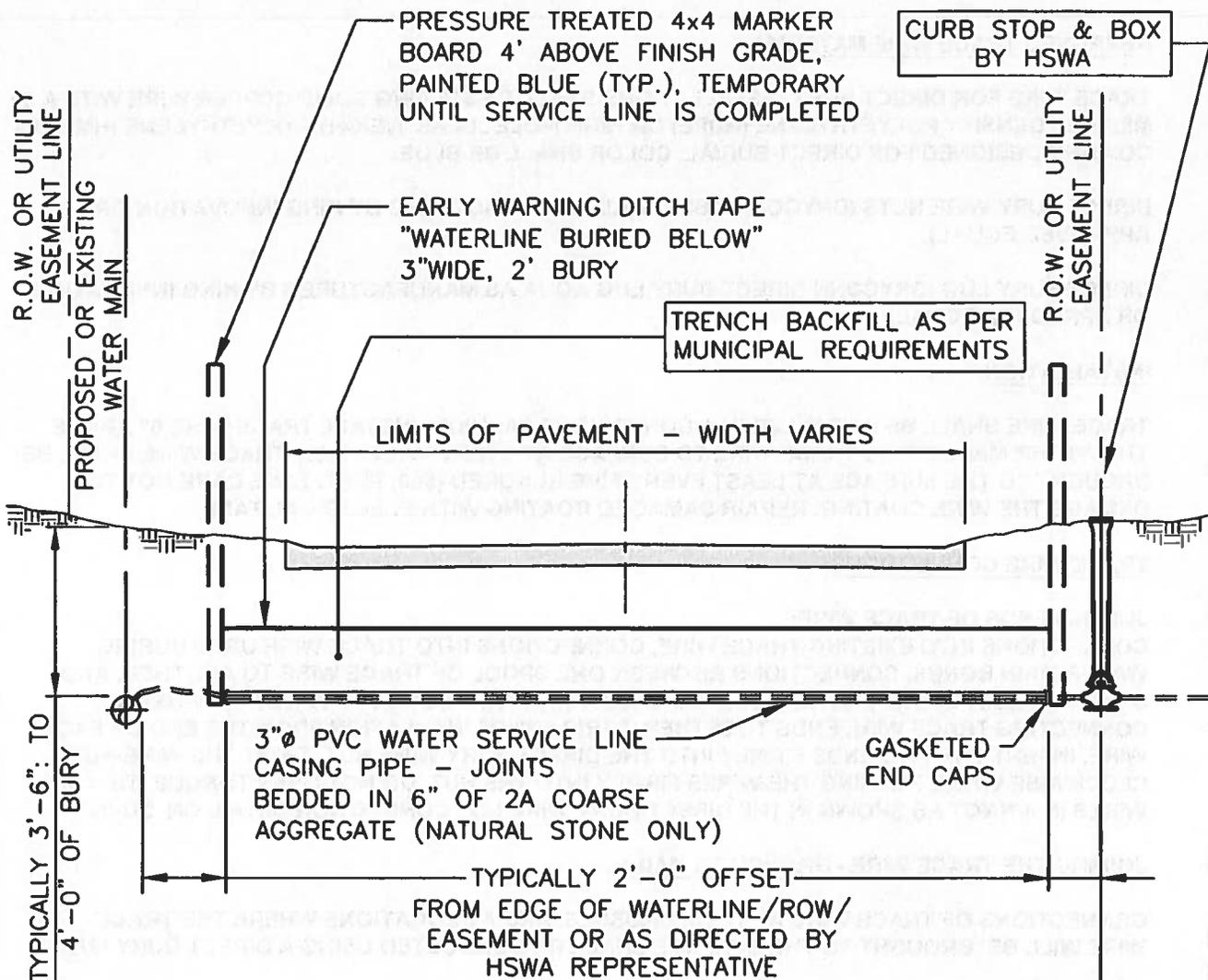
TRACE WIRE SHALL BE EXTENDED TO CURB STOP IF SERVICE IS MUNICIPEX.

TRACE WIRE AT THE END OF THE PVC MAIN:

AT ALL WATER MAIN END CAPS, A MINIMUM OF 6 FEET OF TRACER WIRE SHALL BE EXTENDED BEYOND THE END OF THE PIPE, COILED AND SECURED FOR FUTURE CONNECTIONS. THE END OF THE TRACER WIRE SHALL BE SPLICED TO THE WIRE OF A SIX POUND ZINC ANODE AND IS TO BE BURIED AT THE SAME ELEVATIONS AS THE WATER MAIN.

<p>PREPARED FOR: Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY: KLH ENGINEERS INC 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com</p>	<p>TRACE WIRE SPECIFICATIONS</p> <p style="text-align: right;">2 OF 2</p>
<p>Not to scale</p>	<p>September 2023</p>	<p>Standard Detail SD-027-A</p>

S:\KLH_Template\Standard Details\Client Standard Details\442 Hampton Shaler Water Authority\DWG\SD-28 Service Line.dwg (SD-28) - Mar 07 2025 06:18:36 on PLOTTED BY: jantomas



NOTES:

- 4" HDPE MAY BE CONSIDERED AS ALTERNATE CASING PIPE WHERE INSTALLING BY HORIZONTAL DIRECTIONAL DRILLING PENDING HSWA APPROVAL.
- TAP LOCATIONS SHALL GENERALLY BE IN THE CENTER OF THE LOT TO BE SERVED UNLESS OTHERWISE APPROVED BY HSWA.
- CASING PIPE MUST RUN PERPENDICULAR TO STREET.
- CASING PIPE MUST BE 24" FROM BELL/JOINT UNLESS OTHERWISE APPROVED BY HSWA.

SERVICE LINE INSTALLATION BY HSWA

SERVICE LINE INSTALLATION BY PLUMBER/BUILDER

LONG SIDE WATER SERVICE LINE CASING PIPE DETAIL

<p>PREPARED FOR</p> <p>Hampton Shaler Water Authority</p> <p>3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY</p> <p>KLH ENGINEERS, INC.</p> <p>5173 Campbells Run Road Pittsburgh, Pa 15205 Phone: 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com</p>	<p align="center">DETAIL OF LONG SIDE WATER SERVICE LINE CASING PIPE</p>
<p align="center">Not to scale</p>	<p align="center">March 2025</p>	<p align="center">Standard Detail SD-28</p>

FIRE SERVICE

RPZD:

- REDUCED PRESSURE ZONE DEVICE ASSEMBLY, TYPE & SIZE TO BE DETERMINED BY THE ENGINEER/ARCHITECT & APPROVED BY HAMPTON SHALER WATER AUTHORITY.
- THE ASSEMBLY INCLUDES THE RPZD, GATE VALVES, BY-PASS WITH METER SPREAD CONNECTIONS, LOCKING BALL VALVES, & PIPING.
- DOUBLE CHECK DETECTOR CHECK BACKFLOW PREVENTOR ASSEMBLY REQUIRED OR OTHER BACKFLOW PREVENTION DEVICE APPROVED BY HAMPTON SHALER WATER AUTHORITY.
- PIPING SUPPORTS REQUIRED AT EACH GATE VALVE.

M

TELL TALE TO BE INSTALLED, NORMAL 5/8" x 3/4" CONNECTION SPREAD NEEDED

DOMESTIC SERVICE

ALL DOMESTIC FIXTURES MUST BE CONNECTED TO THE DOMESTIC SERVICE LINE.

M

WATER METER SIZE TO BE DETERMINED BY OWNER/ENGINEER/ARCHITECT & APPROVED BY HAMPTON SHALER WATER AUTHORITY.

M

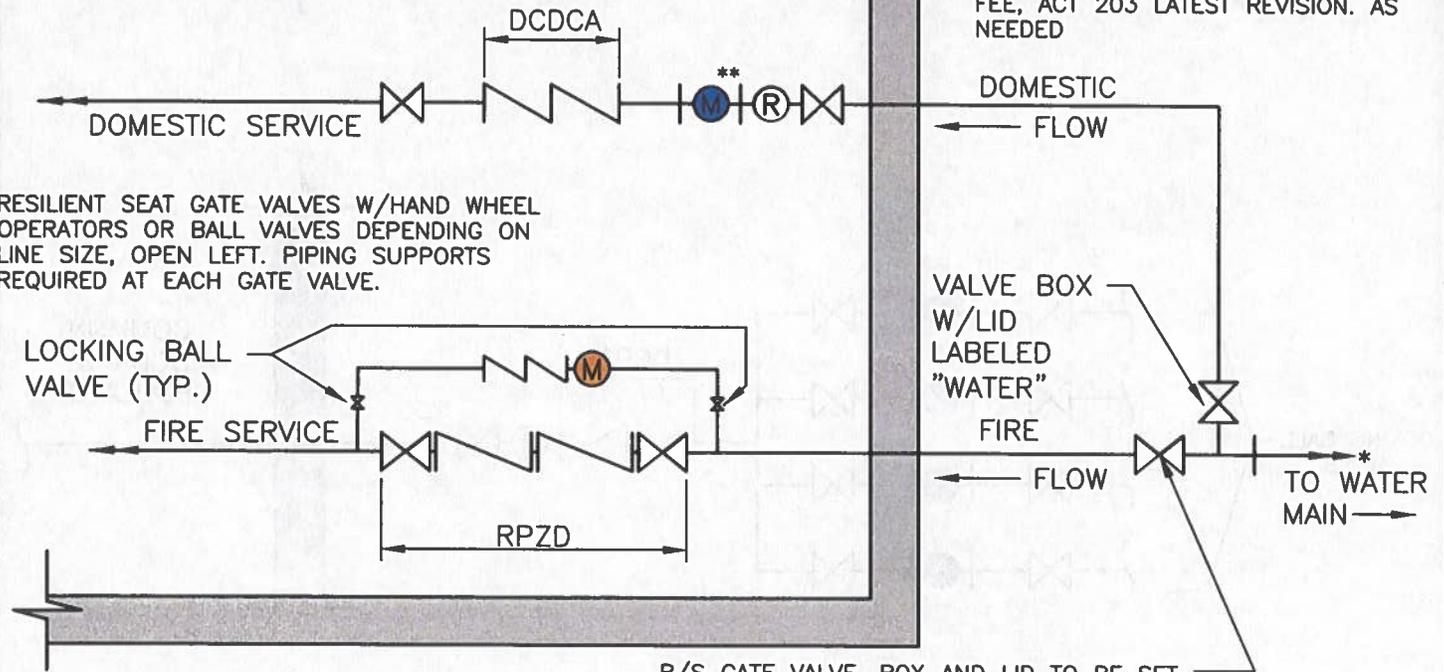
(SIZE & SPREAD TO BE DETERMINED)

R

PRESSURE REGULATOR SUPPLIED BY BUILDING OWNER.

** AFTER REGULATOR, MANIFOLD FOR EACH METER SET AND BACKFLOW DEVICE REQUIRED AS NEEDED FOR INDIVIDUAL UNITS; OR ALTERNATE APPROVED BY HWSA (SEE PG.2)

* HAMPTON SHALER WATER AUTHORITY PERSONNEL TO CUT OR TAP EXISTING WATER MAIN & PROVIDE TEE, GATE VALVES, BOXES & LIDS, SOLID SLEEVE & APPROVED PIPE AT THE EXPENSE OF THE BUILDING OWNER IN ACCORDANCE WITH THE CONNECTION FEE, ACT 203 LATEST REVISION. AS NEEDED



RESILIENT SEAT GATE VALVES W/HAND WHEEL OPERATORS OR BALL VALVES DEPENDING ON LINE SIZE, OPEN LEFT. PIPING SUPPORTS REQUIRED AT EACH GATE VALVE.

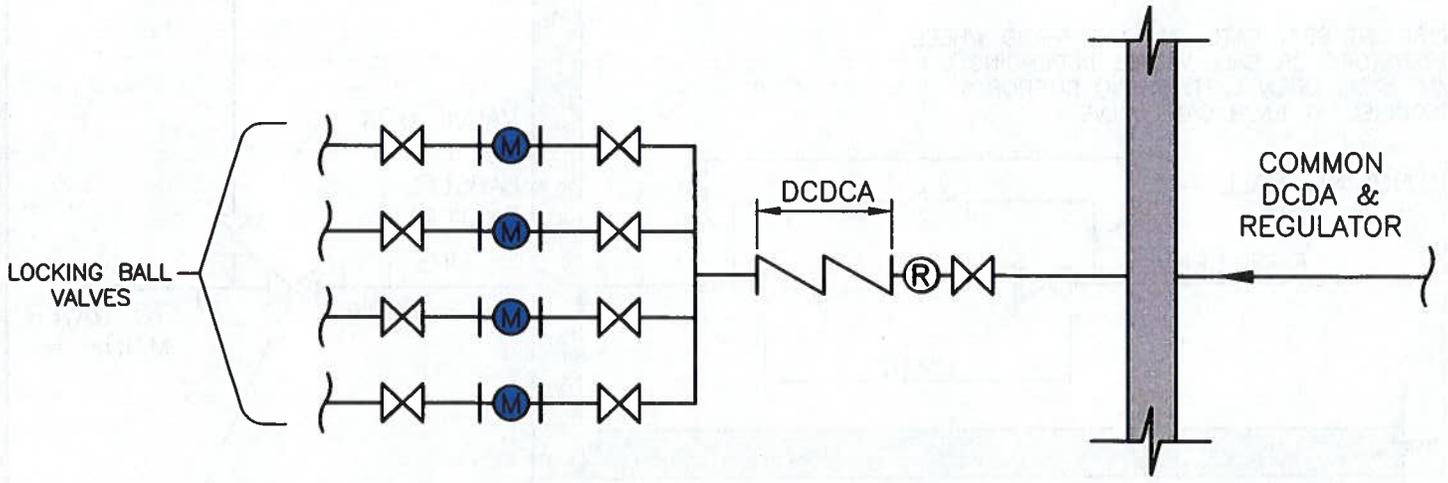
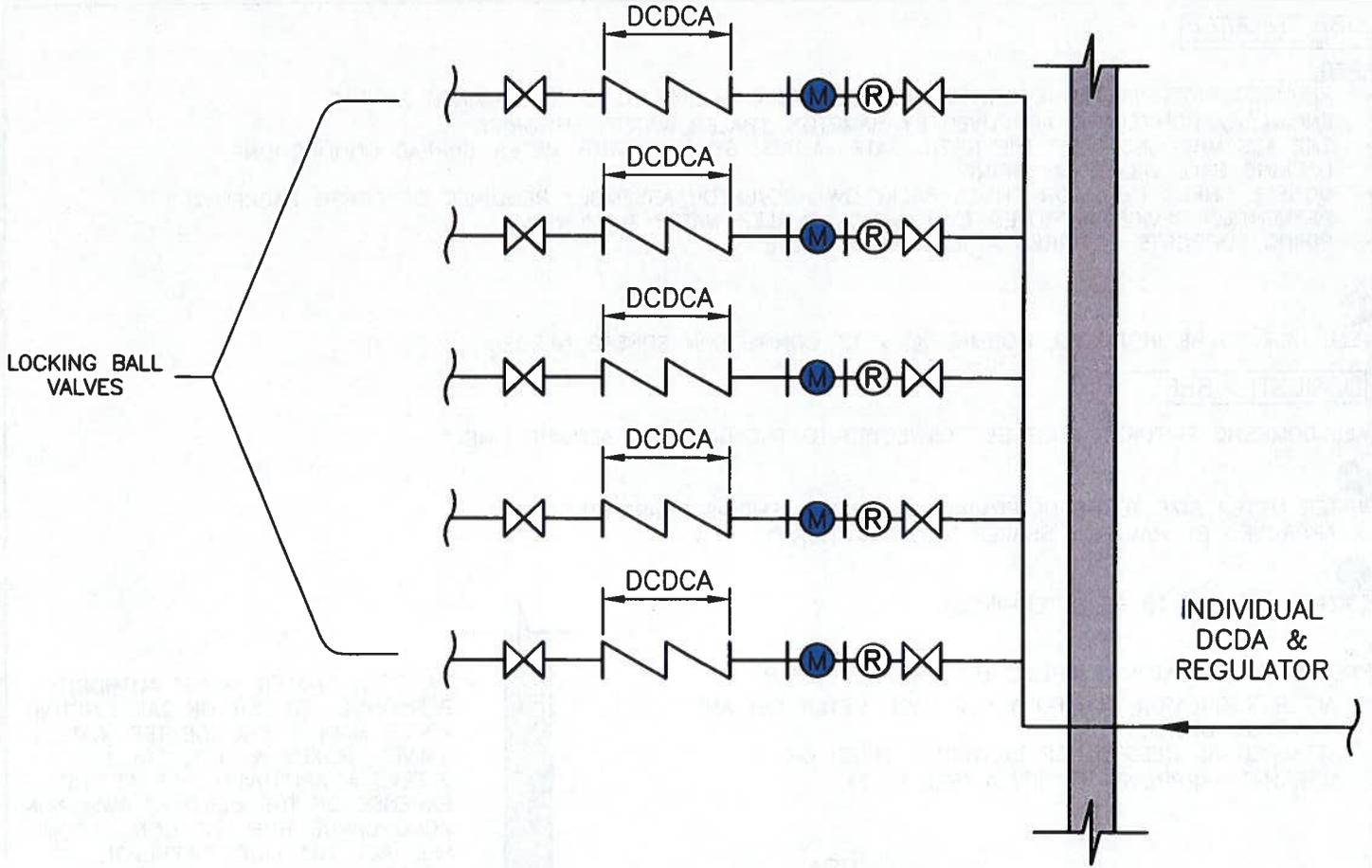
R/S GATE VALVE. BOX AND LID TO BE SET BETWEEN PROPERTY LINE & STRUCTURE. HAMPTON SHALER WATER AUTHORITY MUST INSPECT SERVICE LINE FROM THE CONNECTION AT THE CURB STOP OR VALVE TO THE POINT WHERE IT PENETRATES THROUGH THE FLOOR OR WALL OF THE BUILDING. CONTACT HAMPTON SHALER WATER AUTHORITY TO SCHEDULE INSPECTION PRIOR TO BACKFILLING

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<p>PREPARED FOR: Hampton Shaler Water Authority 3101 McCully Rd Allison Park, Pa 15101 Allegheny County, Pennsylvania</p>	<p>PREPARED BY: KLH ENGINEERS, INC 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone: 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com</p>	<p align="center">COMBINATION FIRE & DOMESTIC DETAIL</p>	
<p align="center">Not to scale</p>	<p align="center">February 2026</p>		<p align="center">Standard Detail SD-30</p>

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COMBINATION FIRE & DOMESTIC DETAIL
ALTERNATIVES WITH MULTIPLE UNITS

Not to scale

February 2026

Standard Detail SD-30

2 OF 2